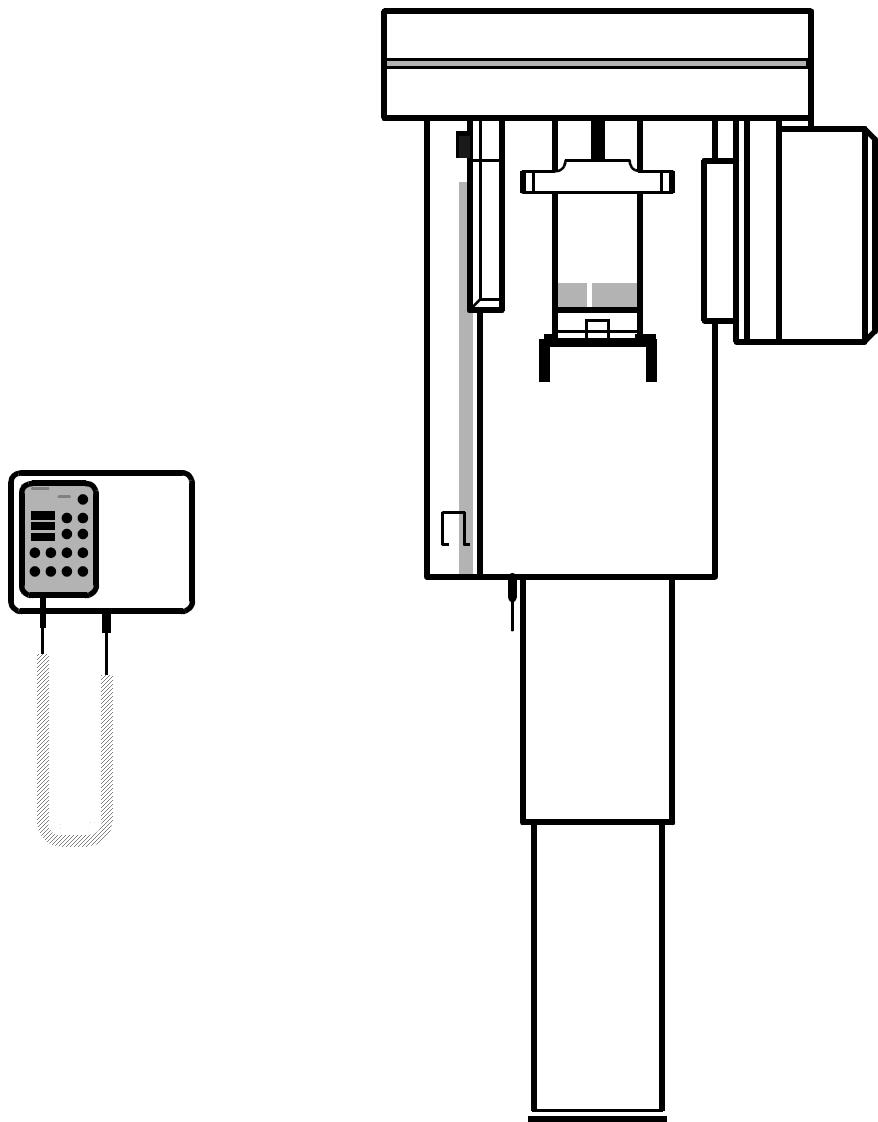


ORTHOPHOS Plus DS

Operating Instructions

English



General information

Dear Customer

Thank you for purchasing your new
ORTHOPHOS Plus DS X-ray unit for panorama planigraphy.

Standard radiographs (jaw region), sinus radiographs (maxillary sinuses) and temporomandibular joint radiographs in digital exposure technique are possible.

For this unit we have provided you with a set of **technical literature**. Keep this literature for quick and easy reference.

In order to protect your rights under Sirona warranty, the purchaser must register the unit by filling out the **Warranty Passport** provided together with the technician immediately after installation of the unit.

Read the **Operating Instructions** to familiarize yourself with the unit before taking radiographs on the patient.

Please observe the **Radiation Protection Regulations** and **Warning Notes**.

These Operating Instructions assume a thorough familiarity with the SIDEXIS software.

Your

ORTHOPHOS Team

Maintenance

To ensure the safety of the patient, the operators and third parties, equipment inspections and maintenance work must be carried out at specified intervals in order to guarantee the operational safety and functional reliability of your product.

It is the responsibility of the operator to ensure that the inspections and maintenance work are carried out.

In the event that the operator fails to fulfil the obligation to carry out inspections and maintenance work or ignores error messages, Sirona Dental Systems GmbH or their contracted dealer cannot assume liability for any damage attributable to this.

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English

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1

Warning and Safety Notes

Labeling of warning and safety information

In order to prevent injury to persons and damage to the equipment you must also read the warning and safety notes given in these Operating Instructions. These are emphasized with ATTENTION and CAUTION.

Intended use

This unit has been designed for use in creating panorama radiographic exposures.

This unit must not be used in areas where there is a risk of explosion.

General safety information

As manufacturers of electro-medical products, we can assume responsibility for safety-related performance of the equipment only if maintenance, repair and modifications are carried out only by us or agencies we have authorized for this purpose, and if components affecting safe operation of the unit that may be needed are replaced with original parts.

We suggest that you request a certificate showing the nature and extent of the work performed, from those who carry out such work, and specify that the certificate show any changes in rated parameters or working ranges, as well as the date, the name of the firm, and a signature.

For reasons of product safety, only **original Sirona accessories** approved for this product, or accessories from third parties which have been released by Sirona may be used. It is the user's risk when using non-released accessories.

Exposures of patients may only be taken if the unit functions fault-free.

Never leave the patient unattended in the unit.

Instructions for avoiding, recognizing and correcting unintended electromagnetic effects:

The ORTHOPHOS Plus DS X-ray System is a unit of class A (classification according to CISPR 11, EN 60601-1-2: 1993 based off IEC 60601-1-2). This unit may be operated in a residential area, provided it is used under the responsibility of a trained medical operator.

Safety measures during switch-on

Following extreme temperature fluctuations, condensate formation may occur; therefore please do not switch on the device until normal room temperature has been reached (see chapter "Technical Description").

When switching on the unit, there must not be a patient positioned in the unit.

If a fault occurs which requires switching the unit off and then back on again, the patient must be taken out of the unit at the latest before switching it on again!

Interference with electromedical devices by radio telephones

To guarantee the operational safety of electromedical devices, it is recommended that the operation of mobile radio telephones in the medical practice or hospital is prohibited.

Malfunction of electronic units/devices which are worn on the patient's body.

In order to prevent failure of electronic units and data storage devices, e.g. radio-controlled watch and telephone card, etc., it is essential that these be removed prior to X-ray exposure.

Radiation Protection

Observe the applicable health physics regulations. The radiation protection facilities should be used.

The operator should remain as far away from the X-ray tube as the cable of the release button permits.

With the exception of the patient, no other persons may remain in the room while the exposure is being made.

Under exceptional circumstances a third person, however not belonging to the dental practice, may then assist. Maintain visual contact with the patient and the unit during the exposure.

In case of faulty operation, discontinue the exposure by releasing the exposure button.

Disassembly and reinstallation

For disassembly and reinstallation of the unit proceed as described in the installation instructions for new installation to ensure perfect function of the unit and its stability.

Disposal

This product's **X-ray tube assembly** includes a tube capable of implosion, a small amount of beryllium, a lead housing and mineral oil. Make certain you observe the appropriate legal regulations when disposing of this product or parts thereof.

2 Technical Description

English

Nominal line voltage:	208V / 230V AC
Permissible fluctuation with 230 V:	+6, -10%
with 208 V:	±10%
Nominal current:	12A
Nominal frequency:	50/60 Hz
Power line resistance:	max. 0,8 Ohm
Fuse at the distribution panel:	16 A slow blow
Rating:	2,8kVA
Tube voltage:	60 – 90 kV
Tube current:	9 – 16mA
Curve form of high voltage:	high frequency, multipulse Residual ripple ≤ 4kV

Filament

Nominal current:	3,0V – 7,5V
Nominal current:	3,0A – 4,2V
Nominal frequency:	DC
Duty cycle:	1:20

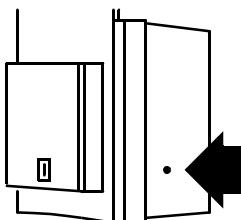
Program duration: see page 41

Exposure time: see page 41

Reproduction scale: With P1 program, medium mandibular arch (plane center) ca. 1:1,19. The image at the image receiver is approximately 19% larger than the real proportions.

Focus size, according to IEC 336,
measured in central ray: 0,5mm

Focus marking:



Automatic exposure blockage (see page 37):

The duration of the exposure blockage (cool-off period) depends on the **kV/mA** step set and the actually triggered radiation time. Depending on the tube load, pause times between 8s and 300s are set automatically.

Example: For P1 program with exposure data 80kV/14mA and a radiation time of 14.1s a pause of 255s results.

Type B equipment

Ordinary equipment (without protection)

Equipment of protective class I
Protection against electric shock:

Protection against penetration of water:

Mode of operation:	Continuous operation
Long time power rating	60W
Target material	Wolfram
Loading factors concerning leakage radiation	0,57mA / 90kV
Source - Image receptor distance	497 mm
Transport and storing temperature:	-40°C – +70°C (-40°F – 158°F)
Permissible operating temperature:	According to IEC 601-1 between +10°C and +40°C (50°F – 104°F)
Relative humidity:	10% – 95%

Sensor (image receptor):

Type:	Digital CCD-technology line sensor, can be plugged to Panorama or Ceph radiography position.
External dimensions:	280mm x 120mm x 35mm
Active sensor surface:	Panorama: 138 x 5.9mm
Resulting image format:	Panorama: depends on selected program, max. 138 x 288mm
Detail recognition:	Panorama: 0.09mm pixel size

Minimum requirements for the PC systems

Hard disk:	> 2 GByte / database > 50 MByte / SIDEXIS installation
RAM:	at least 64 MB
Drives:	CD-ROM 3.5" diskette (one per system / network) MOD drive min. 640 MByte (one per system / network)
Operating system:	Windows 98 Windows NT 4.0 / Service Pack \geq 5
Graphics system:	Resolution at least 1024 x 768 pixels, color depth at least 8 bit
Network:	10 / 100 MBit Ethernet
Communication connection:	RJ45 for LAN cable

ORTHOPHOS Plus DS is in compliance with IEC 601-2-28 / 1993

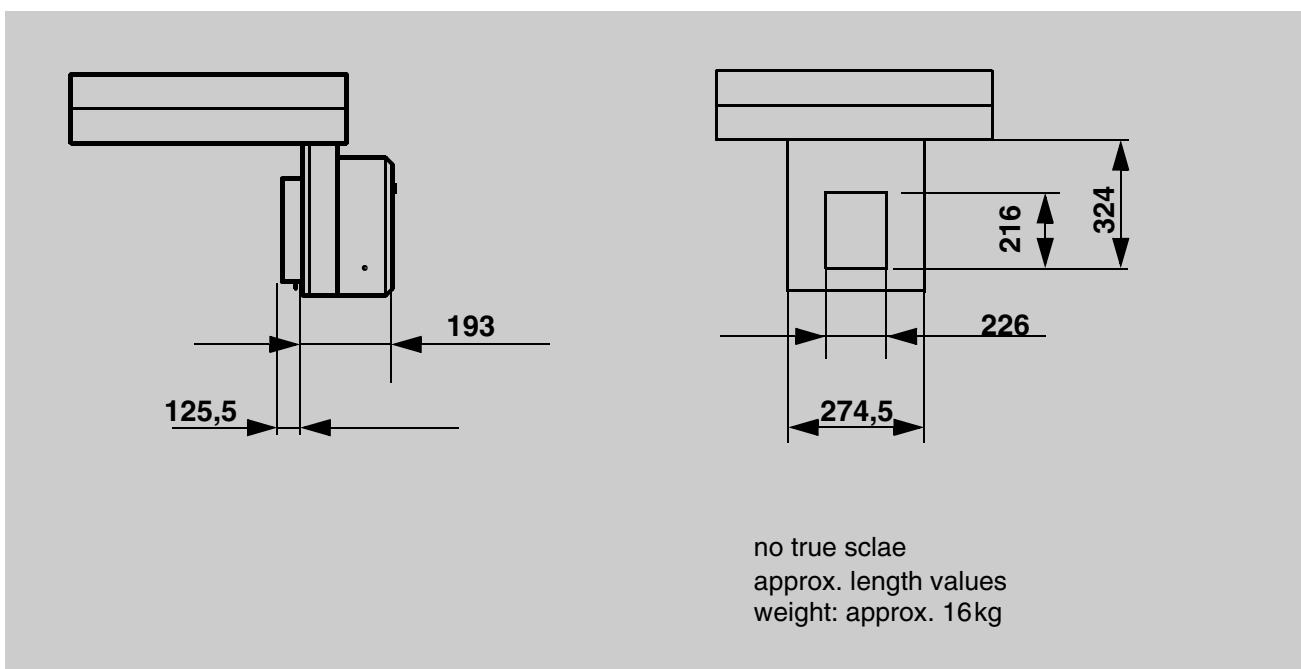
ORTHOPHOS Plus DS is in compliance with IEC 601-1-3 / 1994

Original language: german



This product is provided with a **CE** marking in accordance with the regulations stated in the Directive 93/42/EEC of June 14, 1993 concerning medical products.

0123

Reference axis / Anode angle**Sizes and weight**

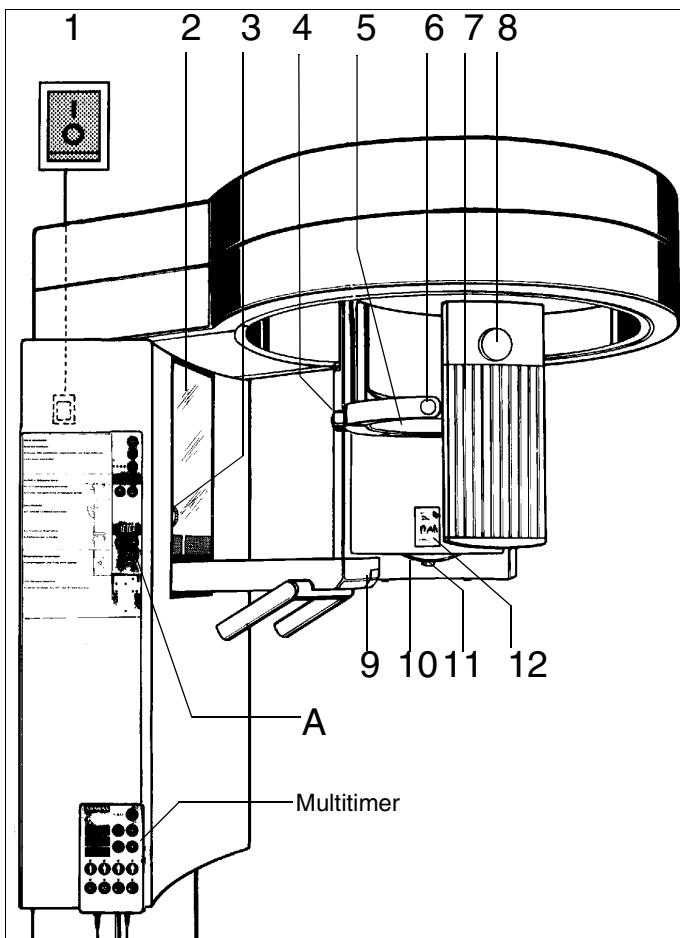
English

Cooling curve for the tube housing:

Anode cooling characteristic:**Heating curve for tube housing:**

3 Operating Controls and Displays

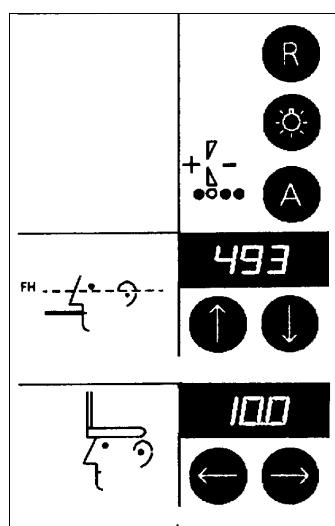
3.1 Unit



- 1 Main switch
- 2 Patient positioning mirror
- 3 Height adjustment for the FH light line
- 4 Adjusting knob for temple supports
- 5 Forehead support
- 6 Temple supports
- 7 Image receiver
- 8 Knob for image receiver removal or insertion
- 9 Button for removing bite block
- 10 Diaphragm wheel
- 11 Locking button for diaphragm wheel
- 12 Primary diaphragm

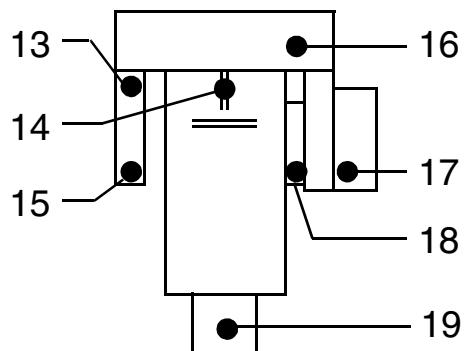
English

3.2 Control Panel A



- Return button R
- Light localizer ON / OFF
- Anomaly button A + - with LED display
- Height adjustment display in mm
- Height adjustment
- Forehead support adjustment display in mm
- Forehead support adjustment
← towards column / away from column →

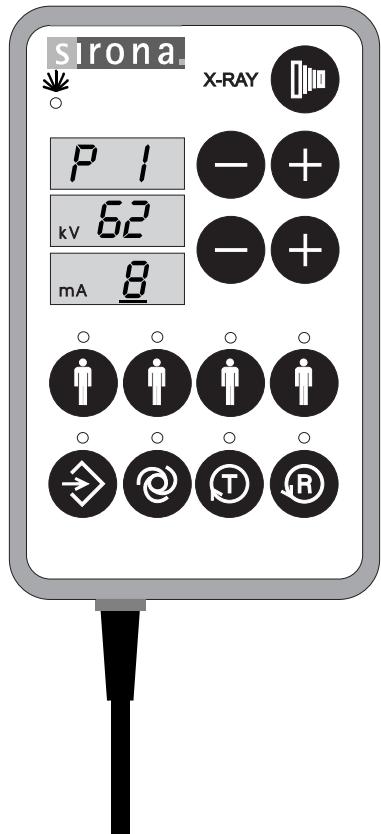
3.3 Help LED-displays



See the inside of the door for a list of appropriate H3/H4 help messages (see page 40).

- 13 SIDEXIS exposure stand-by
- 14 Forehead support position
- 15 Image receiver slot
- 16 X-ray tube position
- 17 Cool-down interval
- 18 Diaphragm adjustment
- 19 Height adjustment

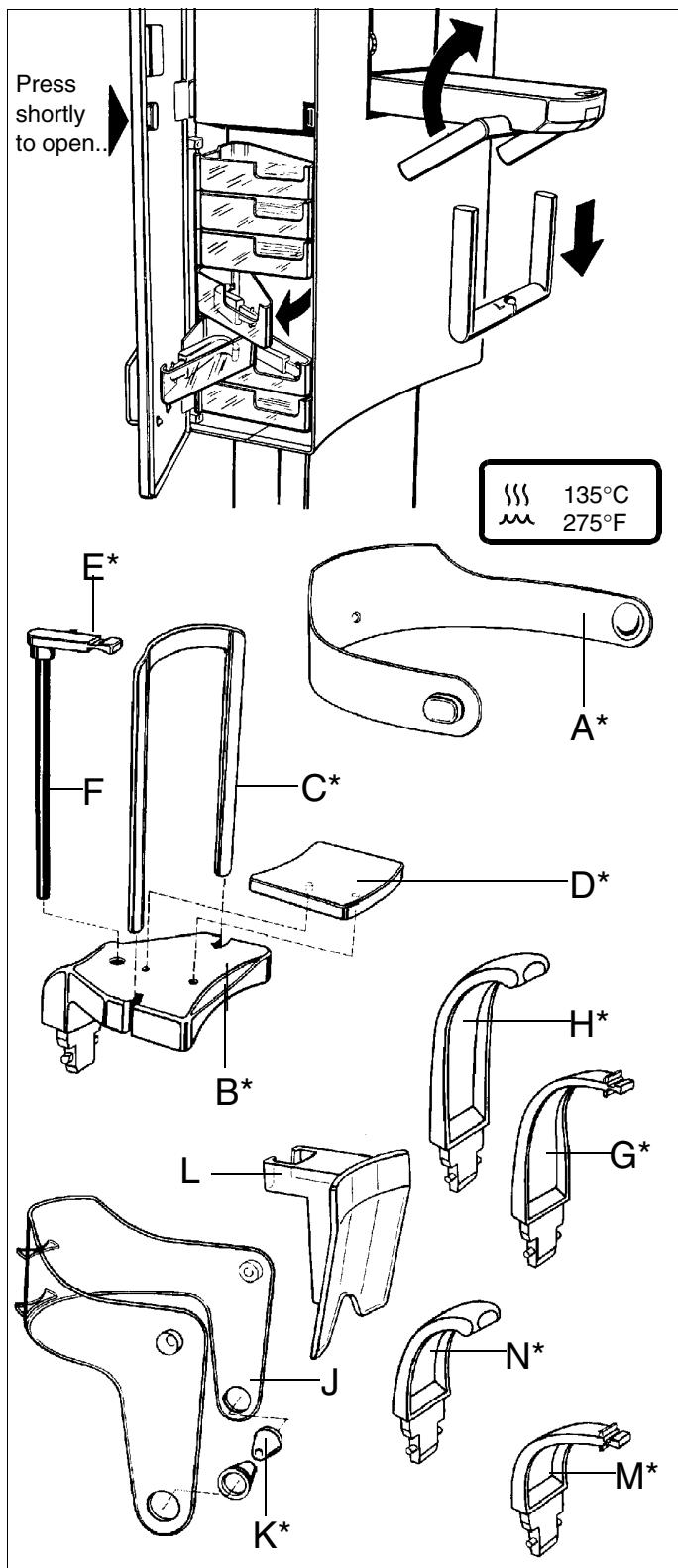
3.4 Multitimer



- "Unit ON" LED
- X-ray X-ray ON indicator
- Exposure button
- Digital display for exposure program / exposure time
with – + buttons for exposure programs
- Digital display for kV/mA values
with – + buttons for kV/mA matched values
- Patient symbols
programmed kV/mA values
- Memory program button
kV/mA matched values
- Button with Service function
- Rotation test button T
without radiation
- Return button R
The LED blinks when the system is not ready (Ready-LED).

4 Accessories

4.1 Rests and supports



The receptacles behind the door are for the storage of accessories and hygienic protective covers.

Handles and * marked accessories can be sterilized.
Sterilize only in an autoclave at 135°C, 2.1 bar (275°F, 30PSI).

Untightened handles can be removed for sterilization as shown.

For tightened handles, please use the hygienic protective covers shown on the next page.

For reorders:

A* Forehead support strip
(5 pcs) Order No. 89 21 835

B* Chin rest complete,
incl. 5xE, 1xF, C, D, R, S
Order No. 18 88 762

C* Bar for chin rest
Order No. 59 61 461

D* Intermediate piece
Order No. 14 49 227

E* Bite block
(10 pcs) Order No. 18 88 887

F Stick for bite block
(5 pcs) Order No. 18 88 895

G* Standard **yellow** bite block
(5 pcs) Order No. 89 21 843

H* Standard **yellow** contact segment
for subnasals
(5 pcs) Order No. 89 31 545

J Head positioner complete,
incl. 4xK
Order No. 18 88 770

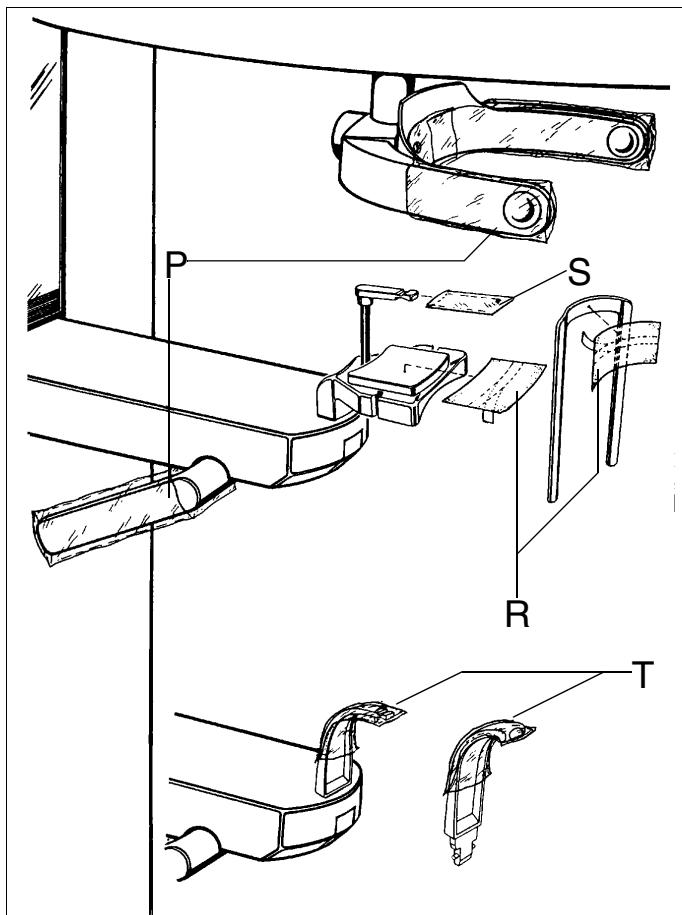
K* Ear fixation
(10 pcs) Order No. 18 88 838

L Contact spacer
Order No. 33 10 336

M* Bite block **blue**, for sinus exposures
(5 pcs) Order No. 89 21 850

N* Contact segment, **blue**,
for subnasals with sinus and paranasal
tomographic exposures
(5 pcs) Order No. 89 31 552

4.2 Hygienic Protective Covers



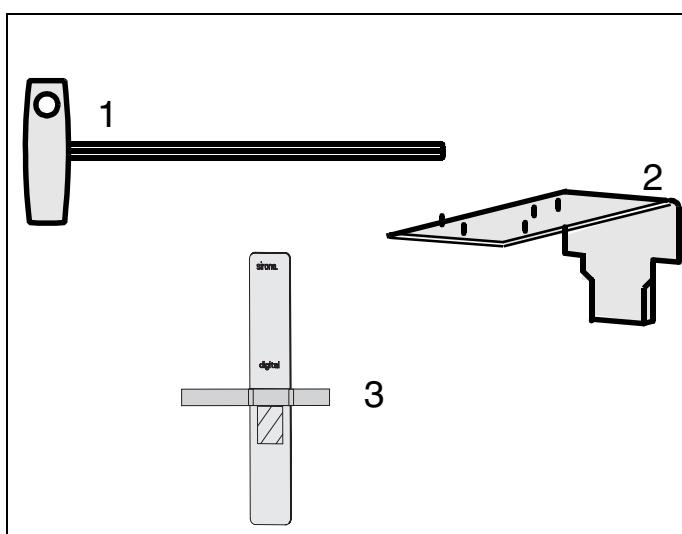
Before each exposure, the hygienic protective covers (disposable) should be attached.

For better illustration of the components, the following figures are shown without the hygienic protective covers.

For orders:

- P** For forehead support and handles
(500 pcs) Order No. 33 14 098
Dimensions: 210mm (140mm) x 57 mm
- R** For chin rest
(100 pcs) Order No. 59 32 603
Dimensions: 75mm x 60mm
- S** For bite block
(500 pcs) Order No. 33 14 072
Dimensions: 43mm x 21 mm
- T** For bite block and contact segment
(500 pcs) Order No. 33 14 080
Dimensions: 80mm x 40mm

4.3 Service Tools

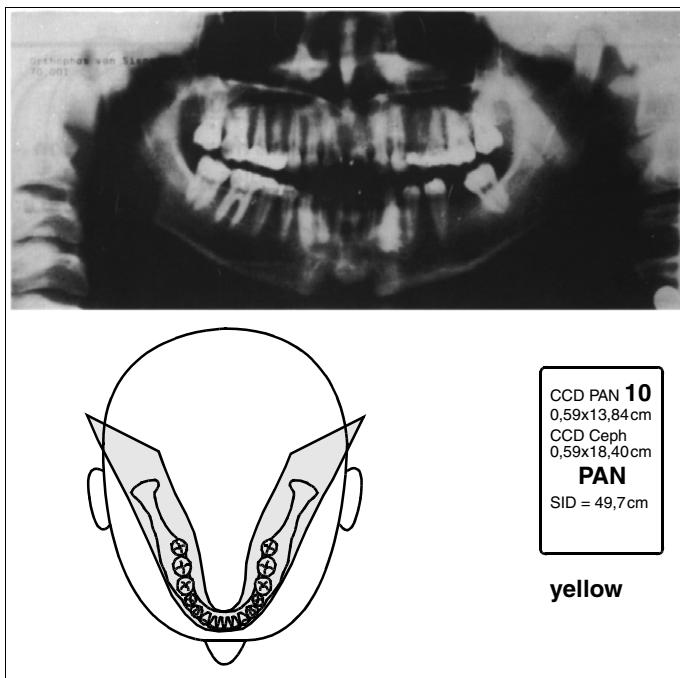


Tools supplied with the unit and needed for the maintenance and/or service **must** remain with the unit.
(Adjustment set).

- 1** Special wrench
Order No. 52 43 605
- 2** Needle phantom
Order No. 89 31 925
- 3** Test block

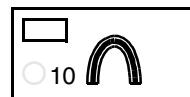
5 Exposure Programs

5.1 P 1 Program



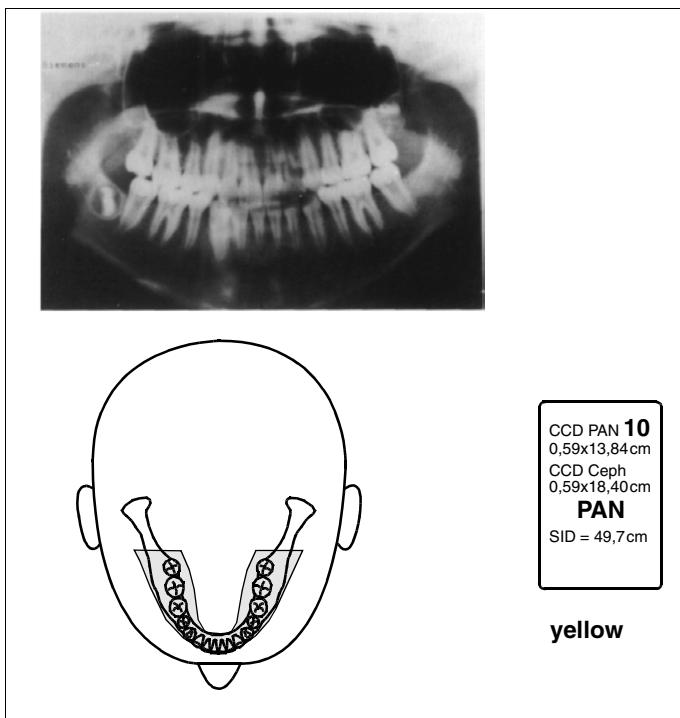
Complete standard exposure

1



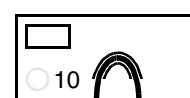
- Chin support with rod and bite block or bar or yellow bite block or contact segment.
- Working area forehead support **00.0 - 30.0**
Head inclination with FH.
- **Automatic selection** of section shape via temple support setting for different mandibular arches.
Radiation time dependent on adjusted width of temple supports.
- **Manual compensation** for anatomical relationships (protrusion, retrusion) by anomaly button A (see page 34).

5.2 P 2 Program



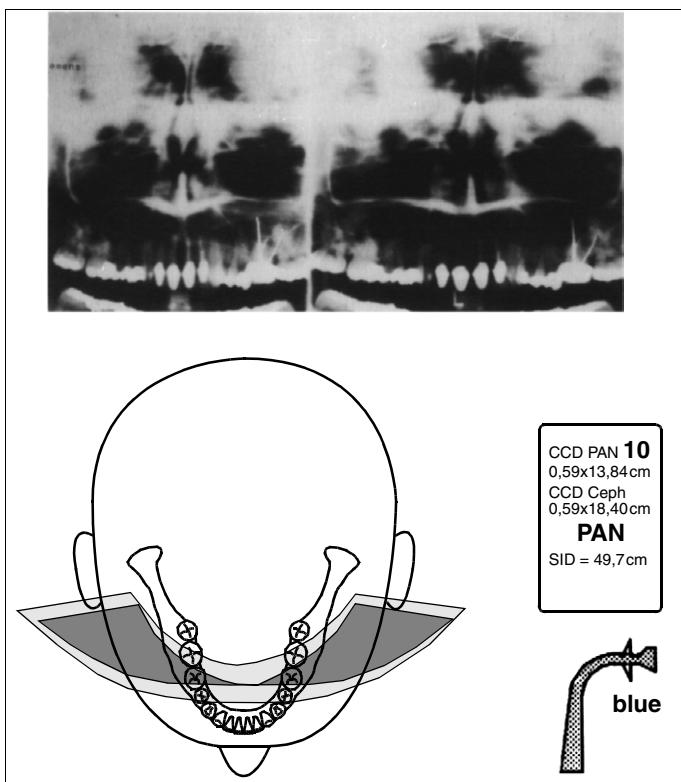
Standard exposure, restricted to the teeth (without ascending branches).

2

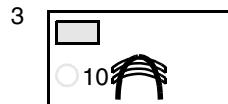


- Chin support with rod and bite block or bar or yellow bite block or contact segment.
- Working area forehead support **00.0 - 30.0**
Head inclination with FH.
- **Automatic selection** of section shape via temple support setting for different mandibular arches.
Radiation time dependent on adjusted width of temple supports.
- **Manual compensation** for the anatomical relationships (protrusion, retrusion) by anomaly button A (see page 34).

5.3 P 3 Program

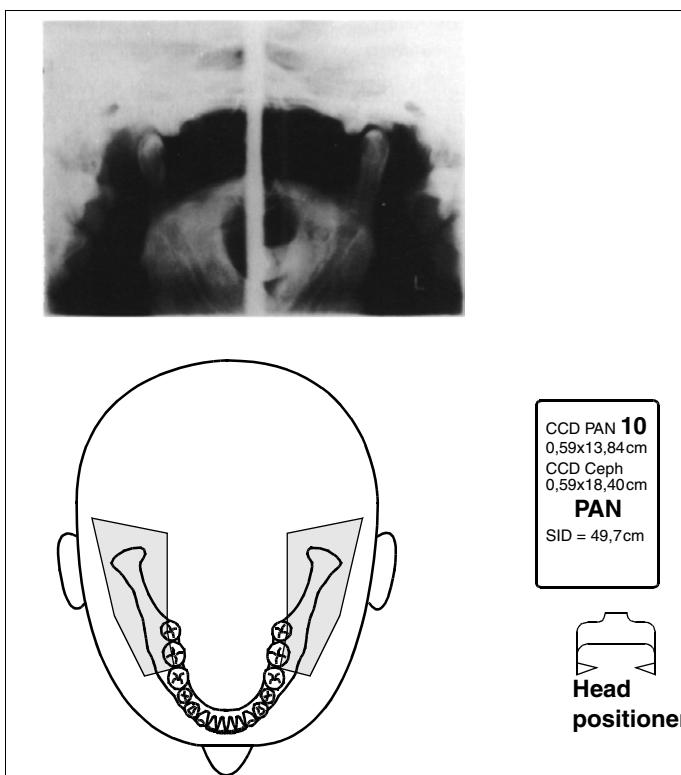


Sinus maxillaris
(2-on-1 image subdivision)

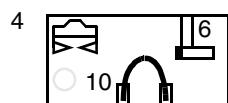


- **Blue** bite block or contact segment.
- Forehead support strip with attachment down (see page 23).
- Working area forehead support **10.0 - 30.0**
Head inclination with FH.
- **Only release trigger when Ready-LED flashes.**
(radiation is released automatically twice in a row).

5.4 P 4 Program

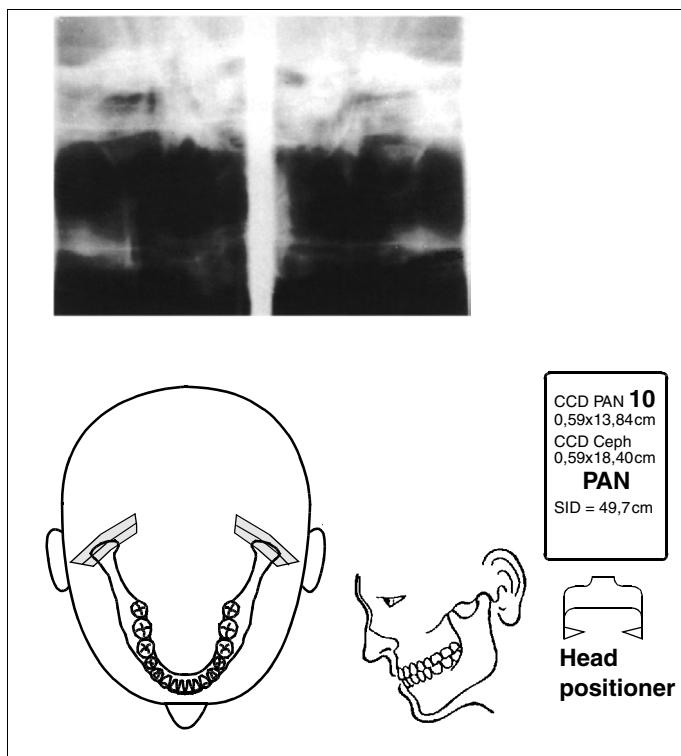


Lateral exposure of the temporomandibular joints
(ascending branches)



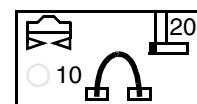
- Insert head positioner (see page 23).
- Working area forehead support **06.0 - 30.0**
Recommended position of forehead support **06.0**.
Head inclination with the aid of FH.

5.5 P 5 Program



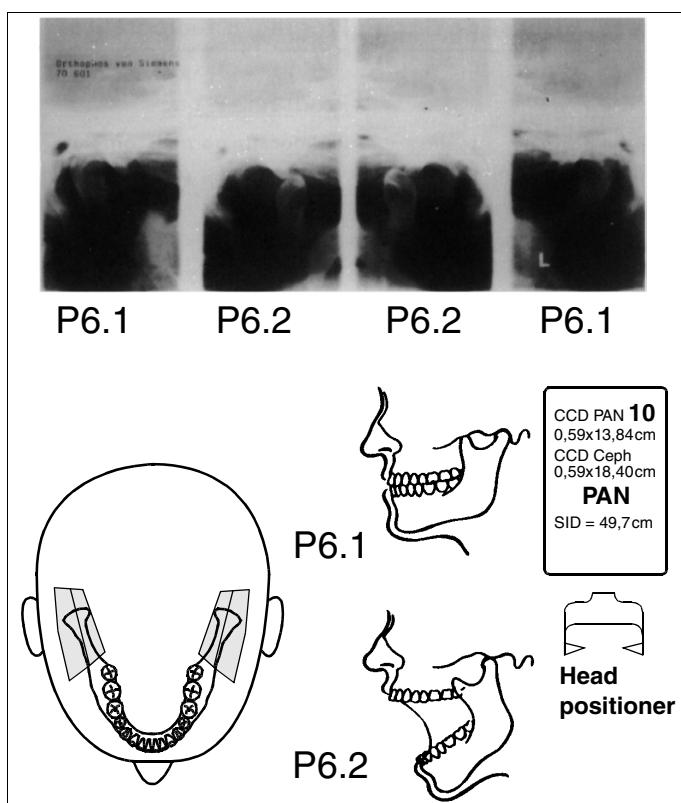
Posterior/anterior exposures of the temporomandibular joints

5



- Insert head positioner (see page 23)
- Working area forehead support **00.0 - 27.0**
Recommended position of forehead support **20.0**
To avoid superimpositions to a large extent, **head inclination** relative to FH toward **anterior**.

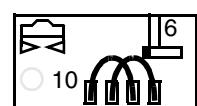
5.6 P 6.1 / P 6.2 Program



Lateral exposures of the temporomandibular joints with closed and open mouth.

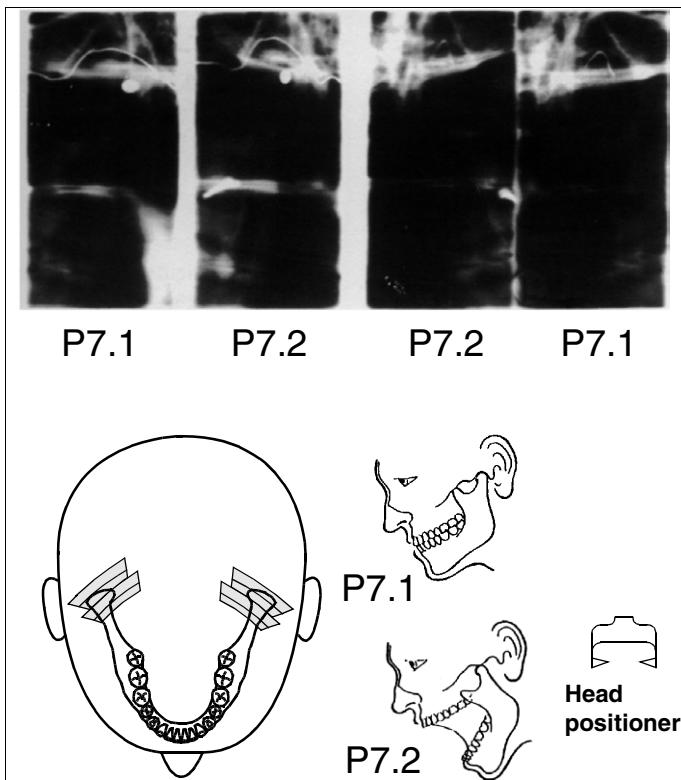
(4 exposures on 1 image)

6

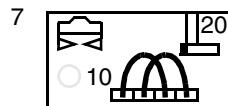


- Insert head positioner (see page 23).
- Working area forehead support **00.0 - 30.0**
Recommended position of forehead support **06.0**
Head inclination with the aid of FH.

5.7 P 7.1/P 7.2 Program



Posterior/anterior exposures of the temporomandibular joints with closed and open mouth.
(4 exposures on 1 image)



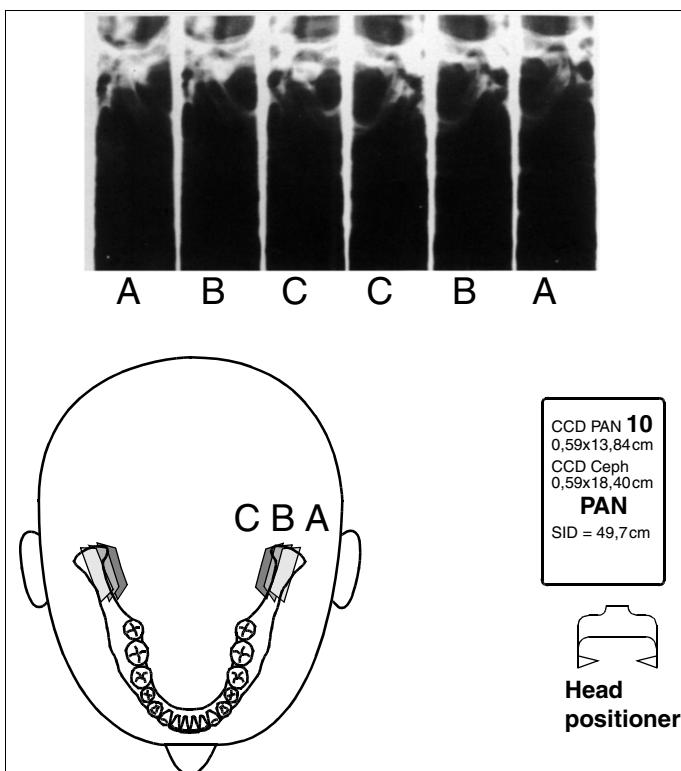
- Insert head positioner (see page 23)
- Working area forehead support **00.0 - 27.0**
Recommended position of the forehead support **20.0**
To avoid superimpositions to a large extent, **head inclination** relative to FH toward **anterior**.

P 7.1 Outer Image:
Closed mouth

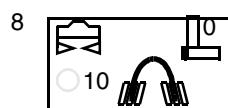
P 7.2 Inner Image:
Open mouth

- Actuate **P 7.1**.
After P7.1 is completed, the unit automatically returns to the initial position.
- Have the patient open his mouth and actuate **P 7.2**.

5.8 P 8 Program

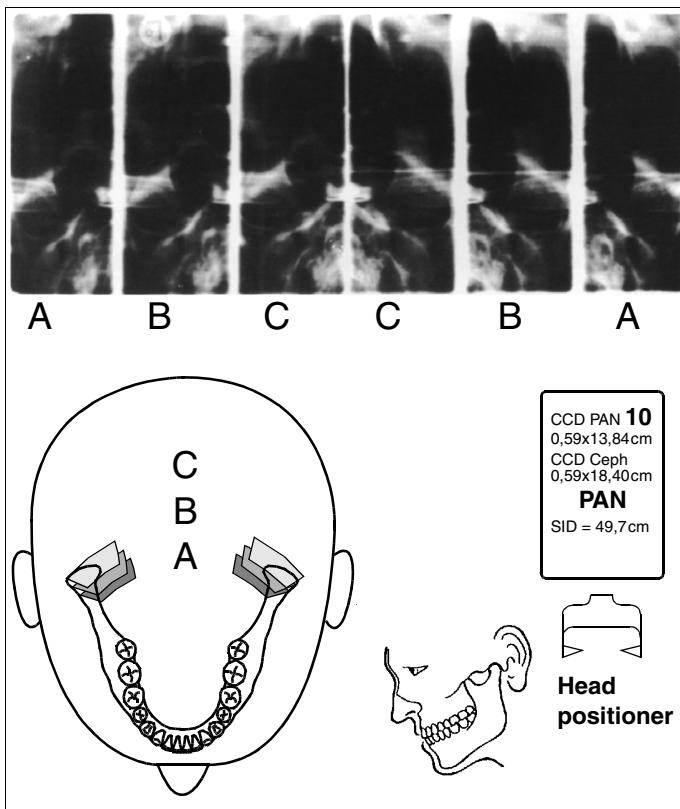


**Multi-layer exposures,
lateral exposures of the temporomandibular joints**
(6 exposures on 1 image)



- Insert head pointer (see page 23)
- Working area forehead support **00.0 - 30.0**
Recommended position of the forehead support **00.0**
Head inclination with the aid of FH.

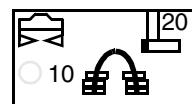
5.9 P 9 Program



Multi-layer exposures, posterior/anterior exposures of the temporomandibular joints.

(6 exposures on 1 image)

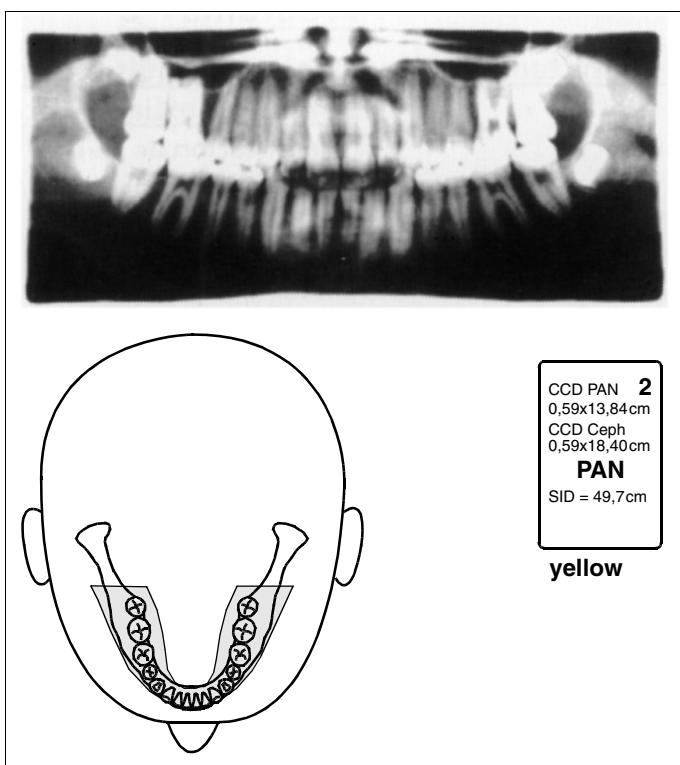
9



- Insert head positioner (see page 23)
- Working area forehead support **00.0 - 27.0**
Recommended position of forehead support **20.0**
To avoid superimpositions to a large extent, **head inclination** relative to FH toward **anterior**

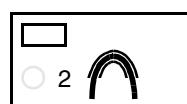
English

5.10 P 10 Program



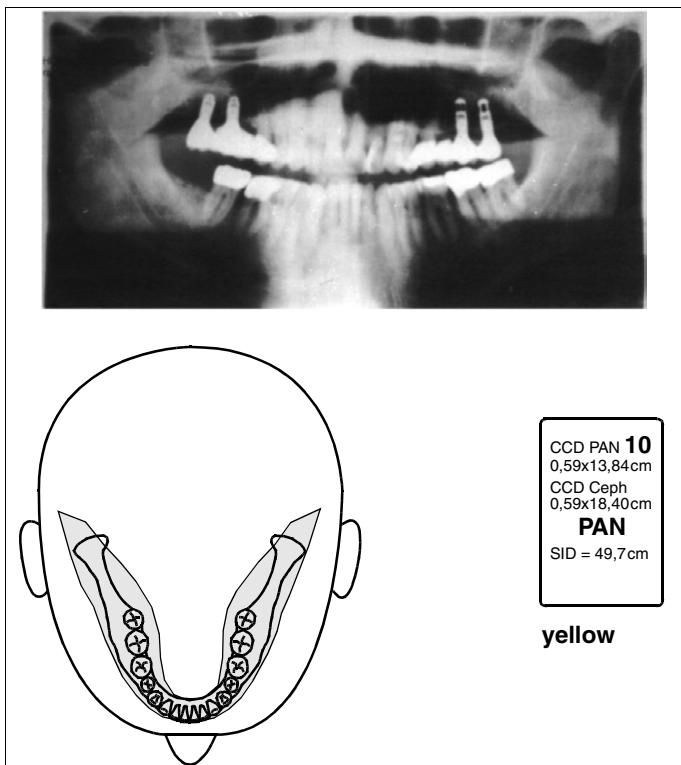
Standard exposure (Status),
preferred mode for children

10



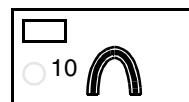
- **IMPORTANT!**
Adjust **diaphragm 2**.
- **Yellow** bite block or contact segment.
- Working area forehead support **00.0 - 30.0**
Head inclination with the aid of FH.
- **Automatic selection** of section shape via temple support setting for different mandibular arches.
Radiation time dependent on adjusted width of temple supports.
- **Manual compensation**
for anatomical relationships (protrusion, retrusion)
by anomaly button **A** (see page 34).

5.11 P 11 Program



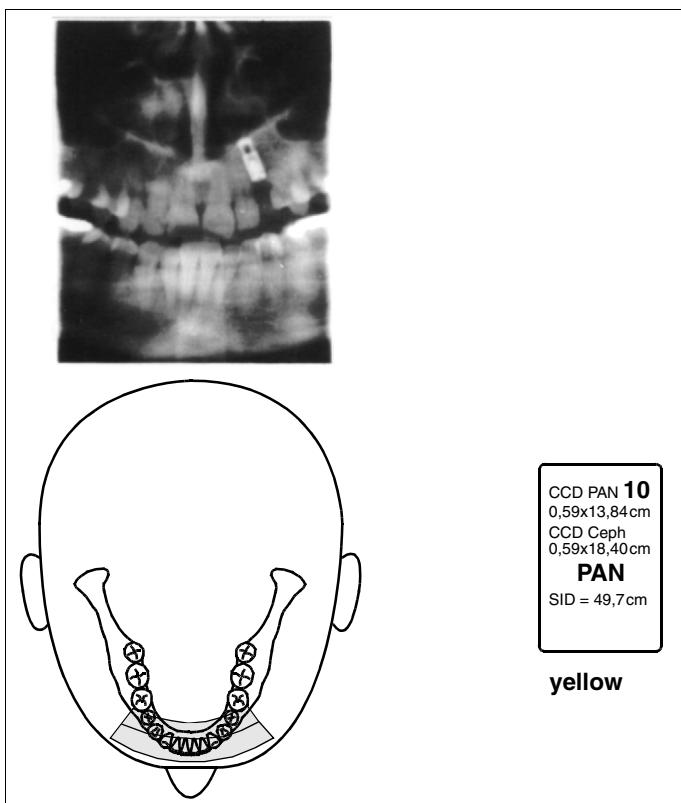
with constant 1.25-fold magnification,
e.g. for implantology

11



- Chin support with rod and bite block or bar or **yellow** bite block or contact segment.
- Working area forehead support **00.0 - 30.0**
Head inclination with the aid of FH.
- **Automatic selection** of section shape via temple support setting for different mandibular arches.
Radiation time dependent on adjusted width of temple supports.
- **Manual compensation**
for anatomical relationships (protrusion, retrusion) by anomaly button **A** (see page 34).

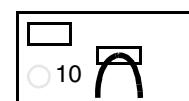
5.12 P 12 Program



Display of the anterior teeth area with larger section thickness

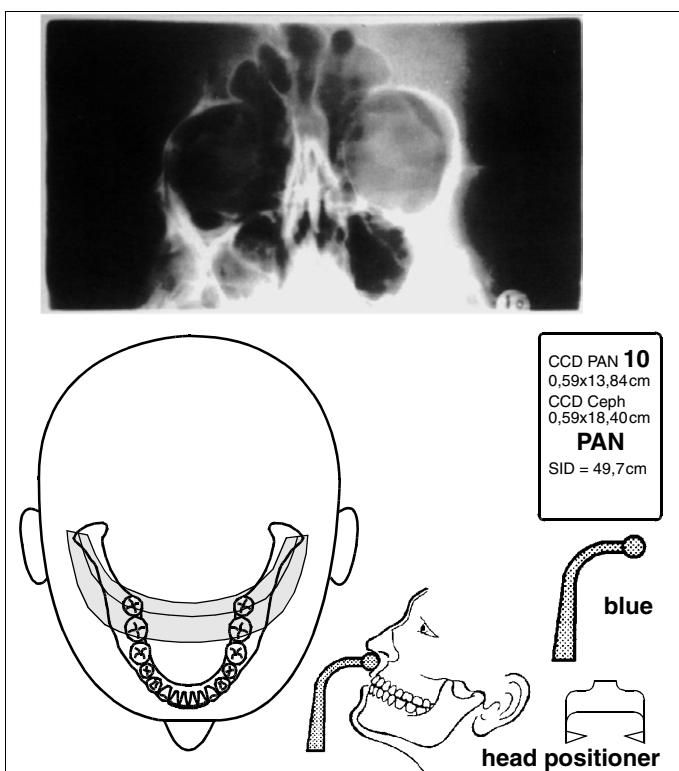
e.g. for implantology

12



- Chin support with rod and bite block or bar or **yellow** bite block or contact segment.
- Working area forehead support **00.0 - 27.0**
Head inclination with the aid of FH.

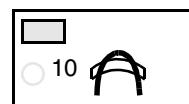
5.13 P 13 Program



Paranasal tomographic exposures

e.g. blow-out fractures

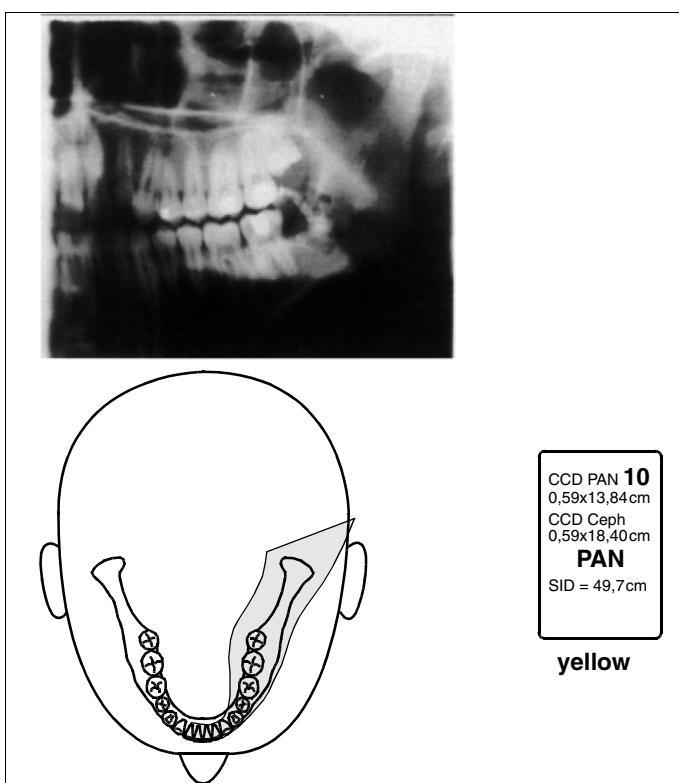
13



- **Blue** contact segment insert subnasal (see page 30)
- Insert head positioner **without ear fixation** (see page 23)
- Working area forehead support **00.0 - 30.0**
Patient head max. reclined.

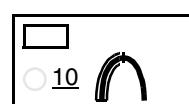
English

5.14 P 14 Program



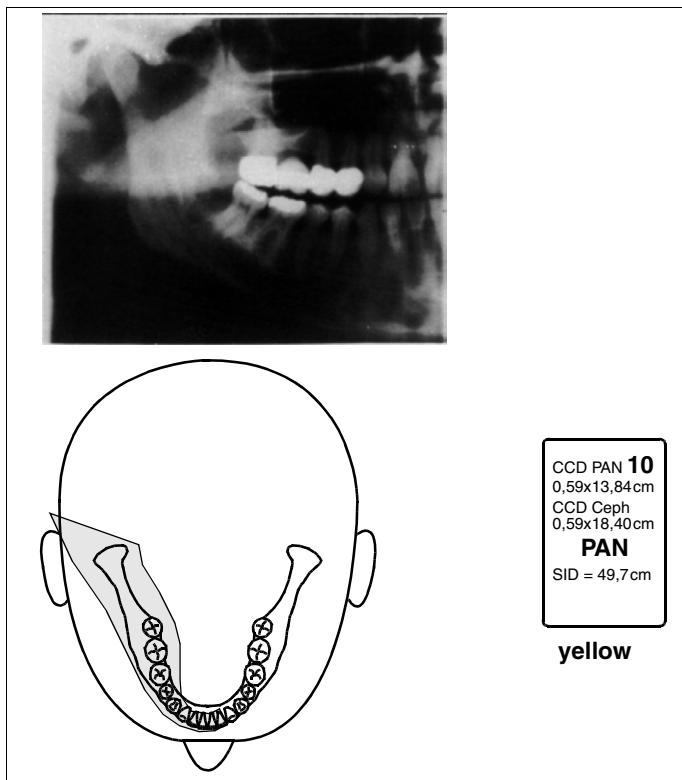
Standard exposure, left half side

14



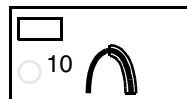
- Chin support with rod and bite block or bar or **yellow** bite block or contact segment.
- Working area forehead support **00.0 - 30.0**
Head inclination with the aid of FH.
- **Automatic selection** of section shape via temple support setting for different mandibular arches.
Radiation time dependent on adjusted width of temple supports.
- **Manual compensation**
for anatomical relationships (protrusion, retrusion)
by anomaly button **A** (see page 34).

5.15 P 15 Program



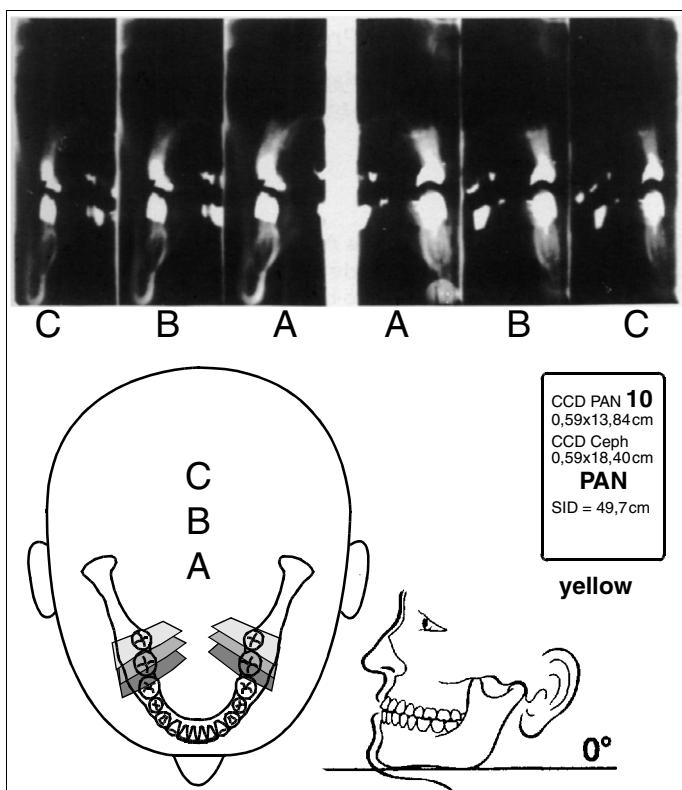
Standard exposure, right half side

15



- Chin support with rod and bite block or bar or **yellow** bite block or contact segment.
- Working area forehead support **00.0 - 30.0**
Head inclination with the aid of FH.
- **Automatic selection** of section shape via temple support setting for different mandibular arches.
Radiation time dependent on adjusted width of temple supports.
- **Manual compensation**
for anatomical relationships (protrusion, retrusion) by anomaly button **A** (see page 34).

5.16 P 16 Program



Multi-layer exposures in the buccal teeth area (6 exposures on 1 image)

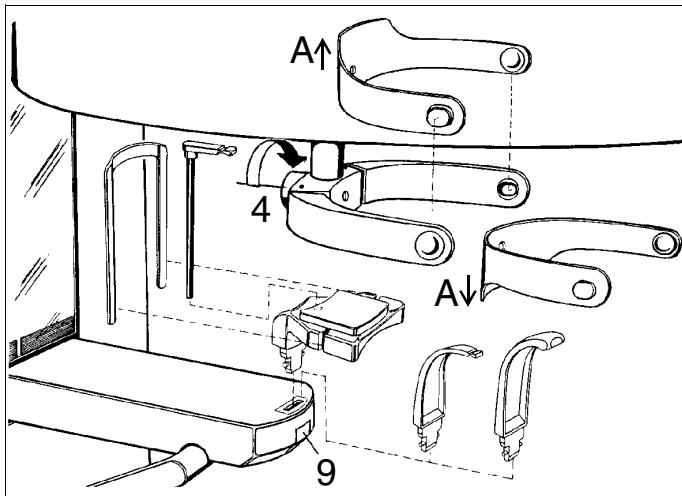
16



- **Yellow** bite block or contact segment.
- Working area forehead support **05.0 - 30.0**
- Mandibular margin horizontally.

6 Operating

6.1 Preparing the Exposure



Insert Accessories

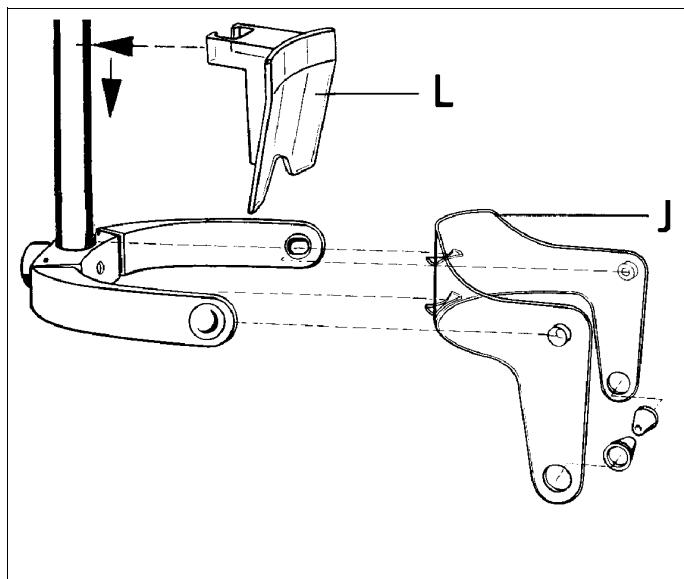
- Insert Chin Rest or Bite Block up to stop.

For application see chapter "Exposure Programs".

- Press button (9) **to remove**.
- **Open Temple Supports** with button (4).

Insert Forehead Support Strip A

- with attachment **A** ↑ up for adults.
- with attachment **A** ↓ down for patients with smaller heads.



Contact Spacer and Head Positioner

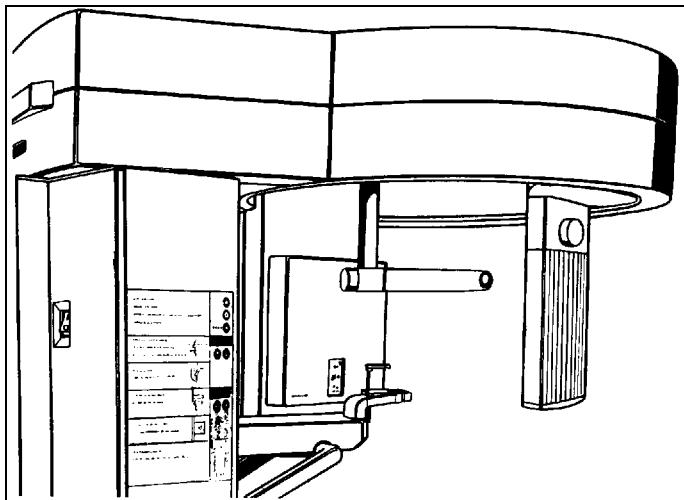
- **Insert Contact Spacer L**

Application for temporomandibular jaw exposure programs P4 – P9.

Always place the contact spacer where, as a result of anatomical features, with correct head positioning there is no contact with the forehead (no 3-point fixing).

- After positioning the head, press the contact spacer onto the tube and push it down to the forehead contact.
- **Insert Head Positioner J**
- Open temple supports,
- Insert head positioner up to stop.

Application for temporomandibular jaw exposure programs **P4–P9** and for paranasal tomography **P13**, but without ear fixation.



Switching ON the Unit

ATTENTION

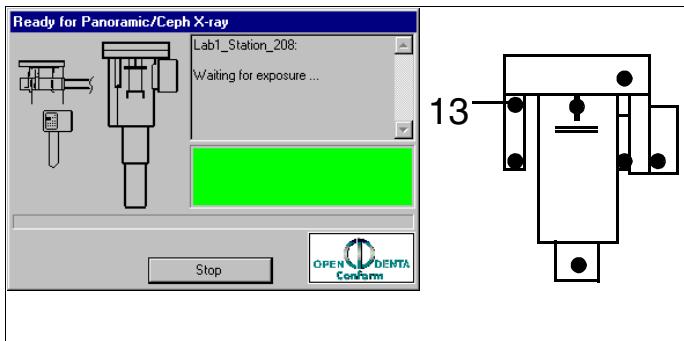
Following extreme temperature fluctuations, condensate formation may occur; therefore please do not switch on the device until normal room temperature has been reached (see chapter "Technical Description").

- Depress the main switch (1) into the I position and wait 1 minute.
- The LED in the upper left corner of the Multitimer will light up.
- The unit adjusts itself automatically:
- The rotating unit moves a little to the right and left.
- The forehead support moves to basic position **10.0**.

ATTENTION

When switching on the unit, there must not be a patient positioned in the unit.

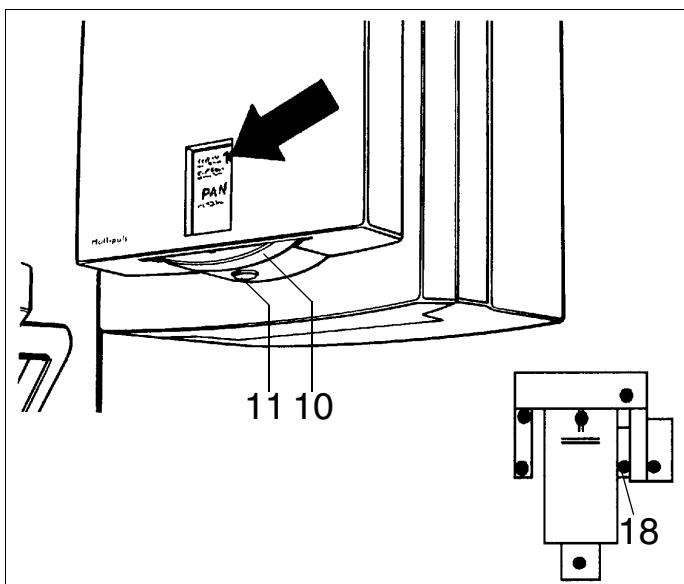
If a fault occurs which requires switching the unit off and then back on again, the patient must be taken out of the unit at the latest before switching it on again!



Switching ON the PC

- Prepare SIDEXIS program on PC for ORTHOPHOS Plus DS (XP) exposure stand-by (see SIDEXIS User's Manual).**

Help LED (13) for SIDEXIS exposure stand-by in Control Panel **A** extinguishes.



Primary Diaphragm

Depending on the exposure program selected, diaphragm **10 or 2** is required.

Diaphragm 2 is preferred for children.

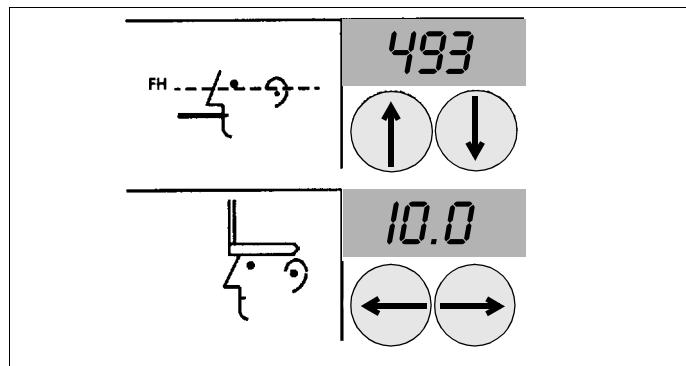
Adjust diaphragm

by pressing button (11) and rotating the diaphragm wheel (10) up to the stop.

The diaphragm number appears in the upper right corner of the window.

When the diaphragm moved into place is not suitable for the program preselected on the Multitimer or when the diaphragm is not correctly locked into place, **Help LED (18) for diaphragm setting** flashes on control panel **A**.

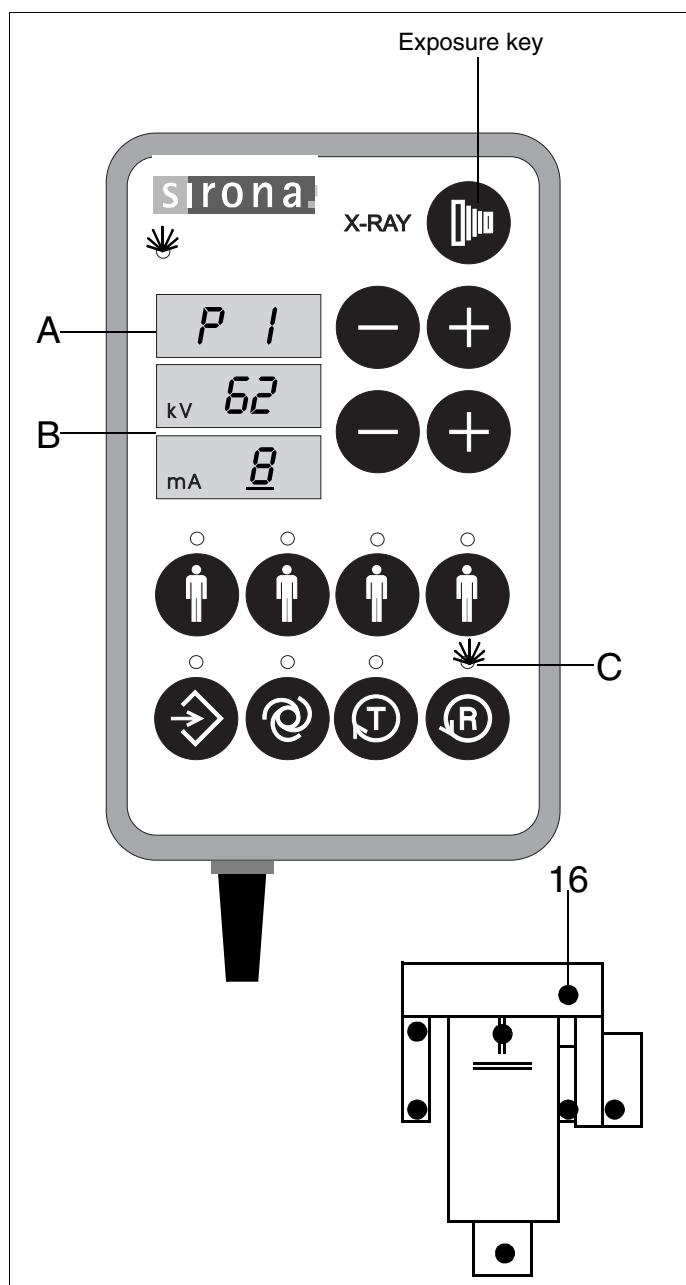
Lock correct diaphragm into place, the LED (18) extinguishes.



Digital Displays

At the control panel A

- The mm value of height adjustment between **000** and **640** from the last patient.
- The basic forehead support value of **10.0** mm.
- or a help message H3... or an error message E... is displayed, same as on the Multitimer (see page 40 and 45).



Multitimer

At the Multitimer the program and exposure parameters employed with the last patient appear.

- A** shows you the exposure program sequentially and the respective maximum exposure time.
- B** gives you the **kV/mA** matched value pair. The LED over the respective patient symbol lights up.
- C** The **LED** over the return button **R** blinks.

Move the rotating unit into place for patient positioning by tapping one of the return buttons **R**.

Help LED (16) for the tube unit position extinguishes on control panel **A**.

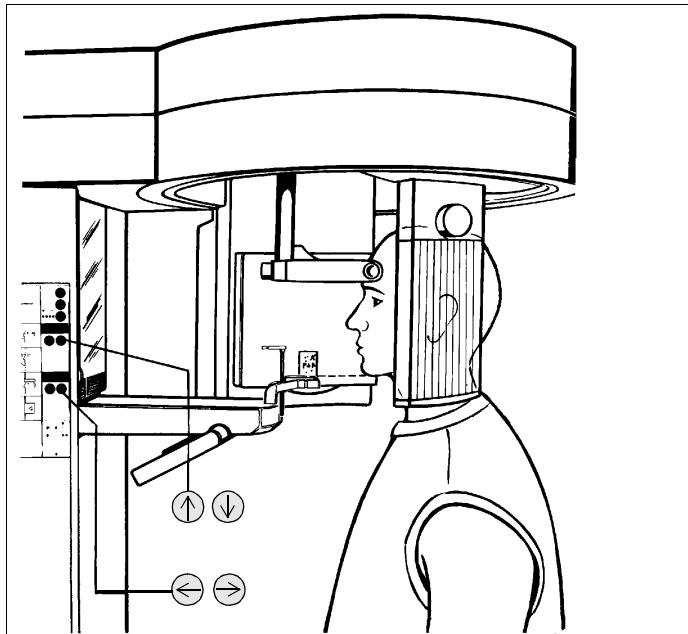
NOTE

You can release a **test rotation without radiation** via the exposure button after having pressed the **T** button.

6.2 Positioning the Patient

Preparations

- Have the patient **remove all metallic objects** such as glasses and jewelry, from the head and neck regions. Have him take out removable dentures.
- Physical constitution, clothing, bandages etc. must not interfere with the functioning of the unit! Perform a test run with the **T** button (see page 25).
- Insert chin rest, bite block/contact segment or head positioner, see "**Exposure Programs**" chapter.



Exposure with Chin Rest and Bite Block

- With programs P1, P2, P10, P11, P12, P14 and P15, move forehead support to the **00.0** position by actuating the \leftarrow key.

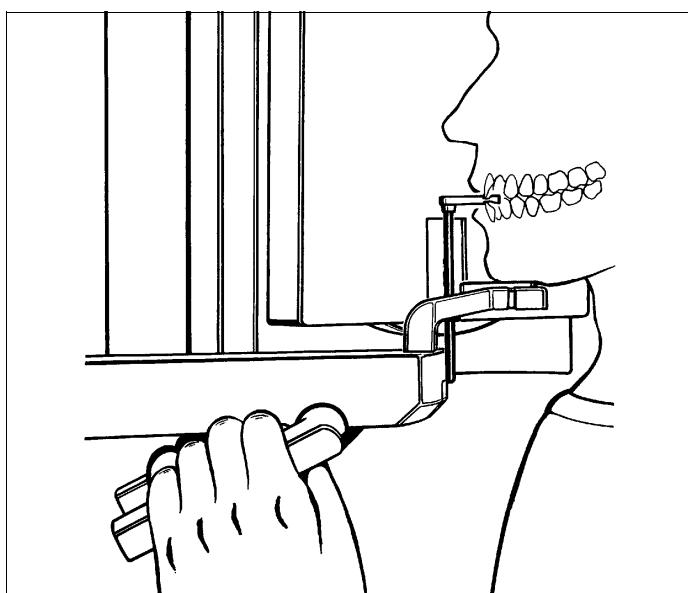
For the forehead support setting for the other programs refer to the "**Exposure Programs**" chapter.

- Have the patient stand in front of the mirror.
- Using the \uparrow and \downarrow buttons, adjust unit height so that **the chin of the patient and the chin rest match up**.

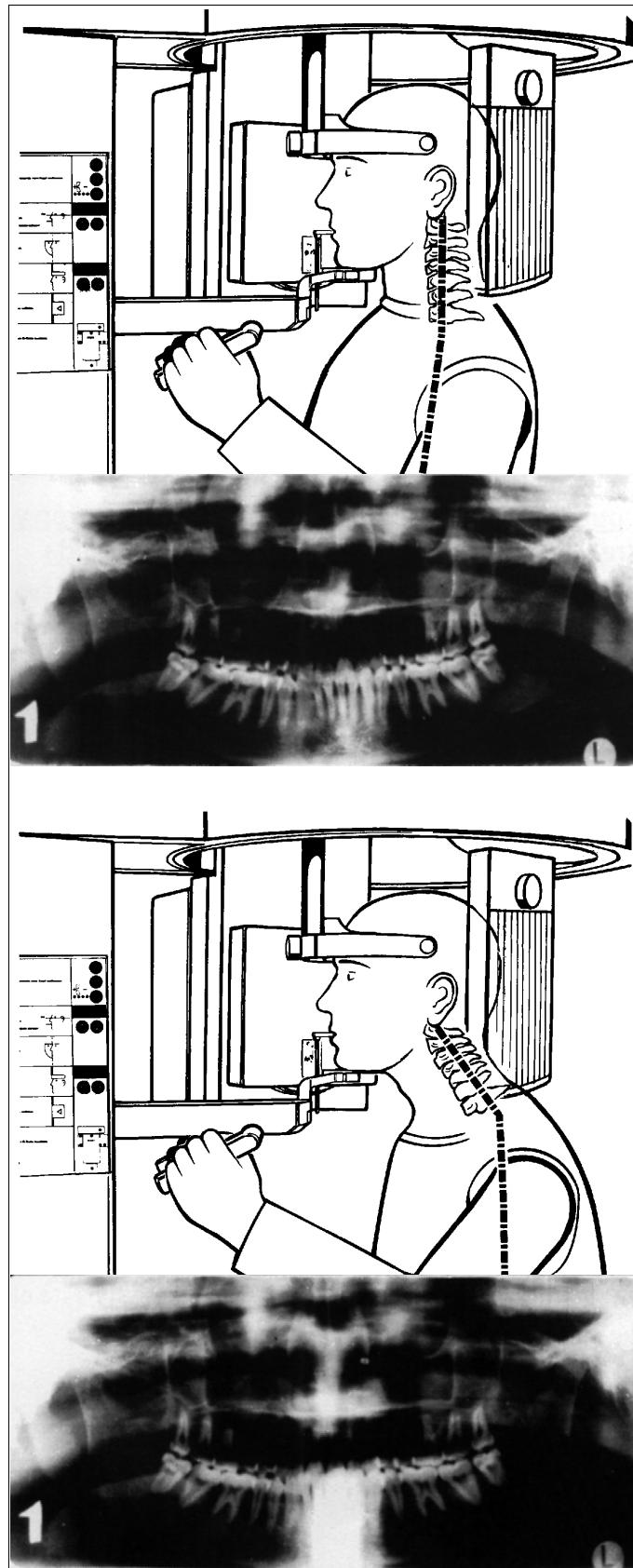
Motoric movement is accompanied by an acoustic signal.

i NOTE

The height adjustment motor starts up slowly and then picks up speed.



- Have the patient place his chin on the chin rest and grip the handles.
- Swing in the bite block.
- Have the patient bite the bite block at the indentation (the upper anterior teeth should be directly in the indentation, and the lower anterior teeth should be moved forward up to the stop).

**ATTENTION**

Make certain the spine is tilted slightly as shown.

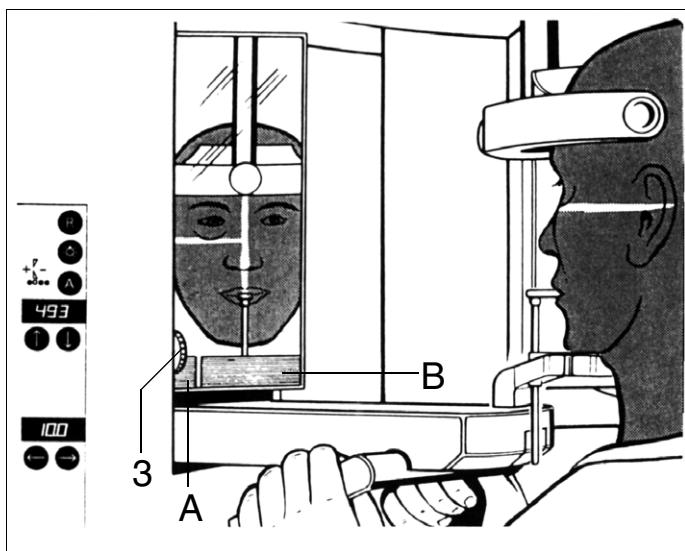
This moves the patient's cervical vertebrae into a more stretched out position.

The cervical vertebrae "stretched out" ensures that the area of the anterior teeth is not over exposed.

In special cases, it is also possible to position for sitting patients.

CORRECT

English



- Swing out the mirror by pressing on field **A**.
- Position the patient's head so that the **biting surface is slightly tilted forward**.
- Switch on the **light localizer** by pressing the key on the control panel. The light localizer facilitates correct positioning of the patient.

i NOTE

The light localizer turns off automatically after about 2,5 minutes.

The Frankfurt horizontal FH

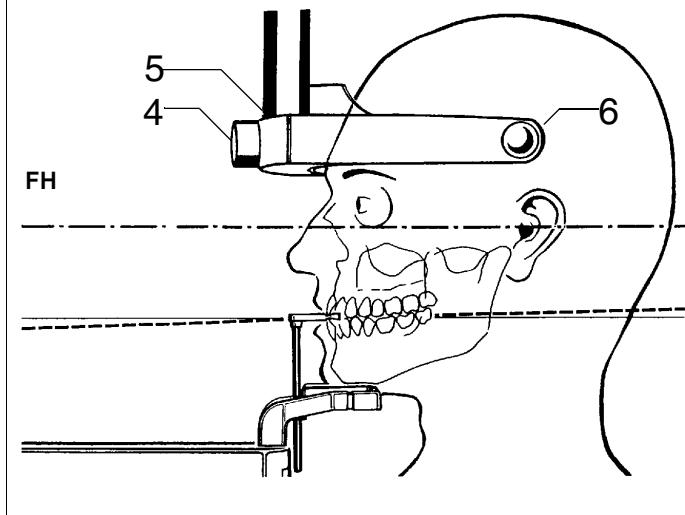
light beam should reflect from the plane passing through the lower margins of the orbits and the upper margins of the external auditory orifices.

The knob (3) can be used to vertically adjust the FH line.

- Finely adjust the head inclination for the FH line adjustment **by tapping** the buttons ↑ or ↓ for vertical unit movement.
- Line up the middle of the patient's face with the **central light line**.
- Press the → button for movement away from the column until the forehead support (5) touches the patient's forehead.

i NOTE

When the temple support position is not suitable for the preselected exposure program, Help LED (14) flashes. Run the temple support into the correct position (see exposure programs), LED (14) extinguishes.



- Position the temple supports (6) firmly with knob (4).

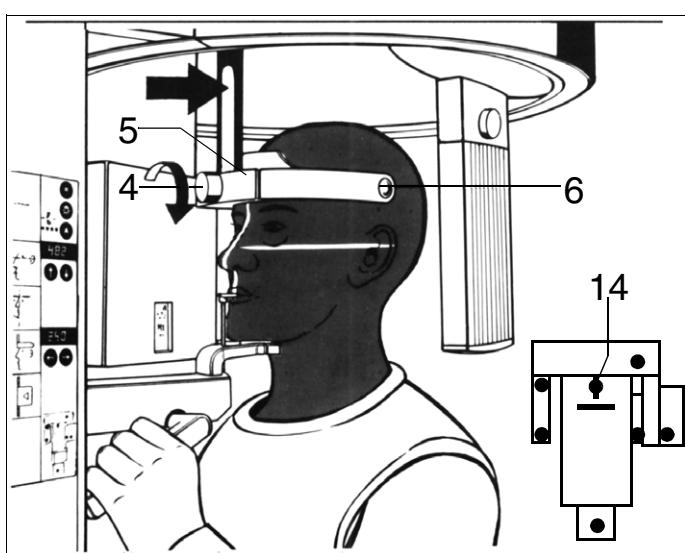
i NOTE

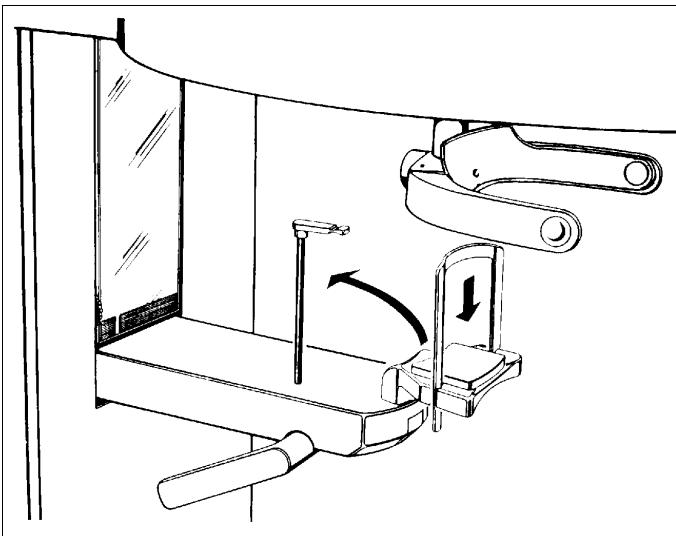
With programs P1, P2, P10, P11, P14 and P15, the radiation time changes as a function of the width of the temple supports.

- Swing back the mirror by pressing on field **B**.
- Have the patient take a **small** step toward the column.
Recheck the FH-line position.
- Have patient press tongue against roof of palate.

Digital displays

The reference values for height and forehead support are displayed on the control panel.

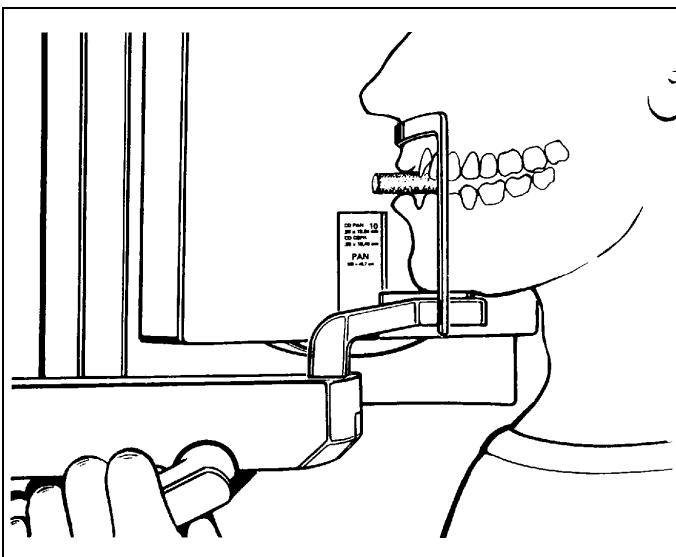




Exposure with Chin Rest and Bar

For patients without anterior teeth

- Remove bite block with holding rod and insert bar as shown (bow facing column).



- Ensure that the upper and lower jaws are lined up with each other.

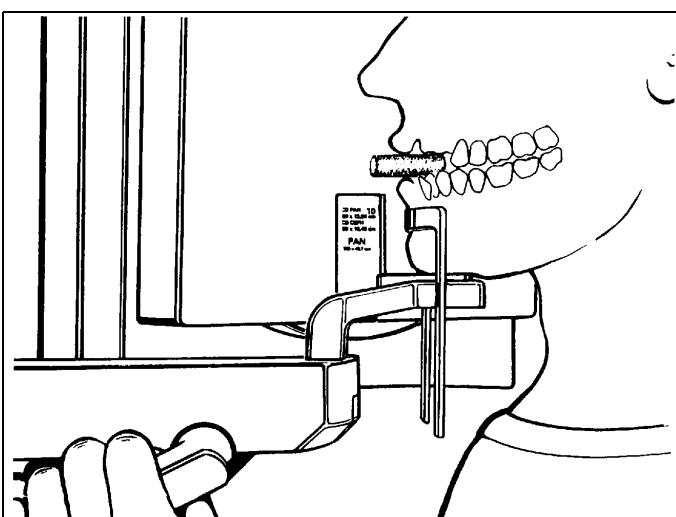
This is facilitated by a cotton roll.

- Proceed as in the case of exposures with chin rest and bite block.

Deviation:

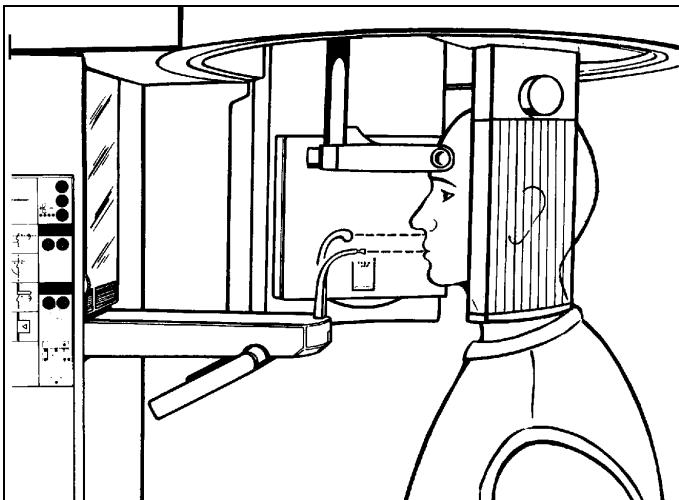
The patient places his chin on the chin rest.

- To position the head optimally for tomographic exposures, the bar should be just under the patient's nose.



- If there are still anterior teeth in the lower jaw, place the bar between chin and lower lip.

- Have patient press tongue against roof of palate.

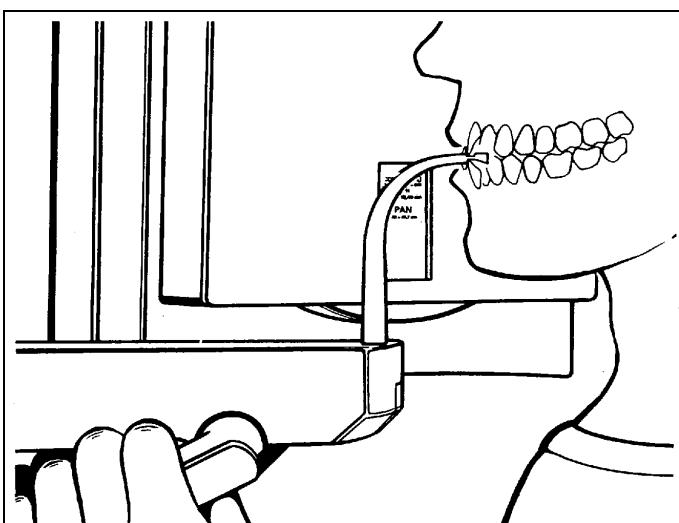


Exposure with Bite Block or Contact Segment without Chin Support

- With programs P1, P10, P14 and P15, move the forehead support to the **00.0** position by actuating the ← key.

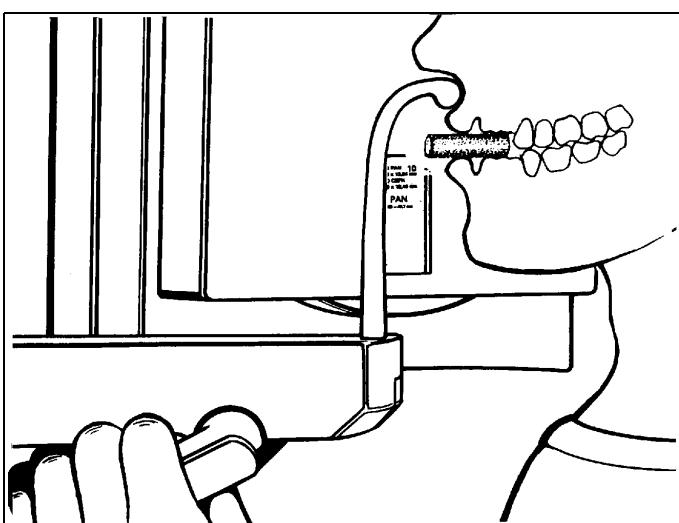
For the forehead support setting for the other programs refer to the "Exposure Programs" chapter.

- Have the patient stand in front of the mirror.



... with Bite Block

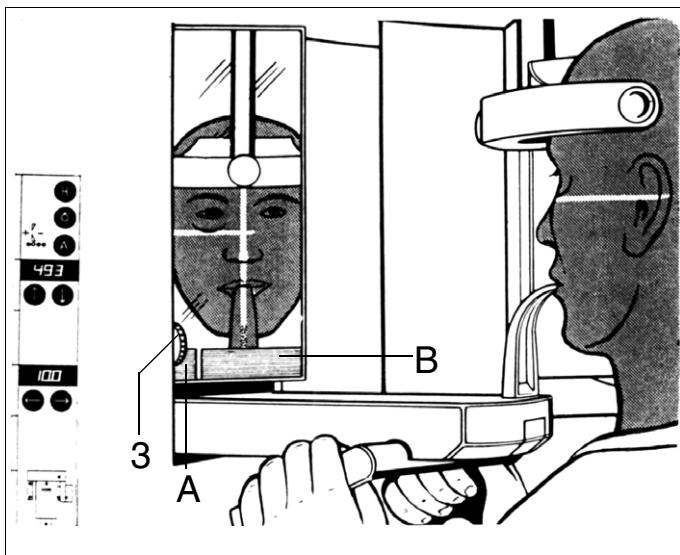
- Using the ↑ and ↓ buttons, adjust unit height so that the **bite block and the anterior teeth match up**.
- Have the patient grip the handles.
- Have the patient bite the bite block at the indentation. The upper anterior teeth should be directly in the indentation, and the lower anterior teeth should be moved forward up to the stop.



... with Contact Segment

For patients without anterior teeth

- Adjust the unit height so that **contact segment and subnasals match up**.
- The contact segment should be just under the patient's nose. **Ensure that the upper and lower jaws are lined up with each other.** This is facilitated by a cotton roll.
- Ensure that the spine is **slightly tilted** as described before.



- Swing out the mirror by pressing on field **A**.
- Position the patient's head so that the **biting surface is slightly tilted forward**.
- Switch on the **light localizer** by pressing the key on the control panel. The light localizer facilitates correct positioning of the patient.

i NOTE

The light localizer turns off automatically after about 2,5 minutes.

The Frankfurt Horizontal FH

light beam should reflect from the plane passing through the lower margins of the orbits and the upper margins of the external auditory orifices.

The knob (3) can be used to vertically adjust the FH line.

- Finely adjust the head inclination for the FH line adjustment by **tapping** the buttons ↑ or ↓ for vertical unit movement.
- Line up the middle of the patient's face with the **central light line**.
- Press the → button for movement away from the column until the forehead support (5) touches the patient's forehead.

i NOTE

When the temple support position is not suitable for the preselected exposure program, Help LED (14) flashes. Run the temple support into the correct position (see exposure programs), LED (14) extinguishes.

- Position the temple supports (6) firmly with knob (4).

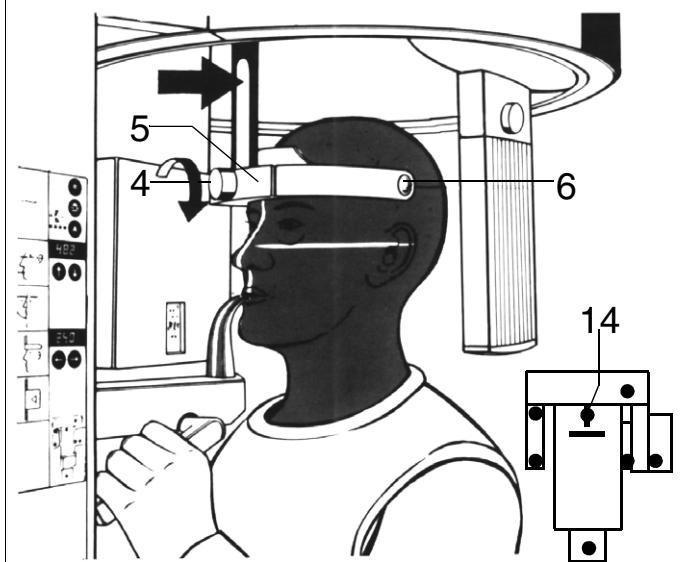
i NOTE

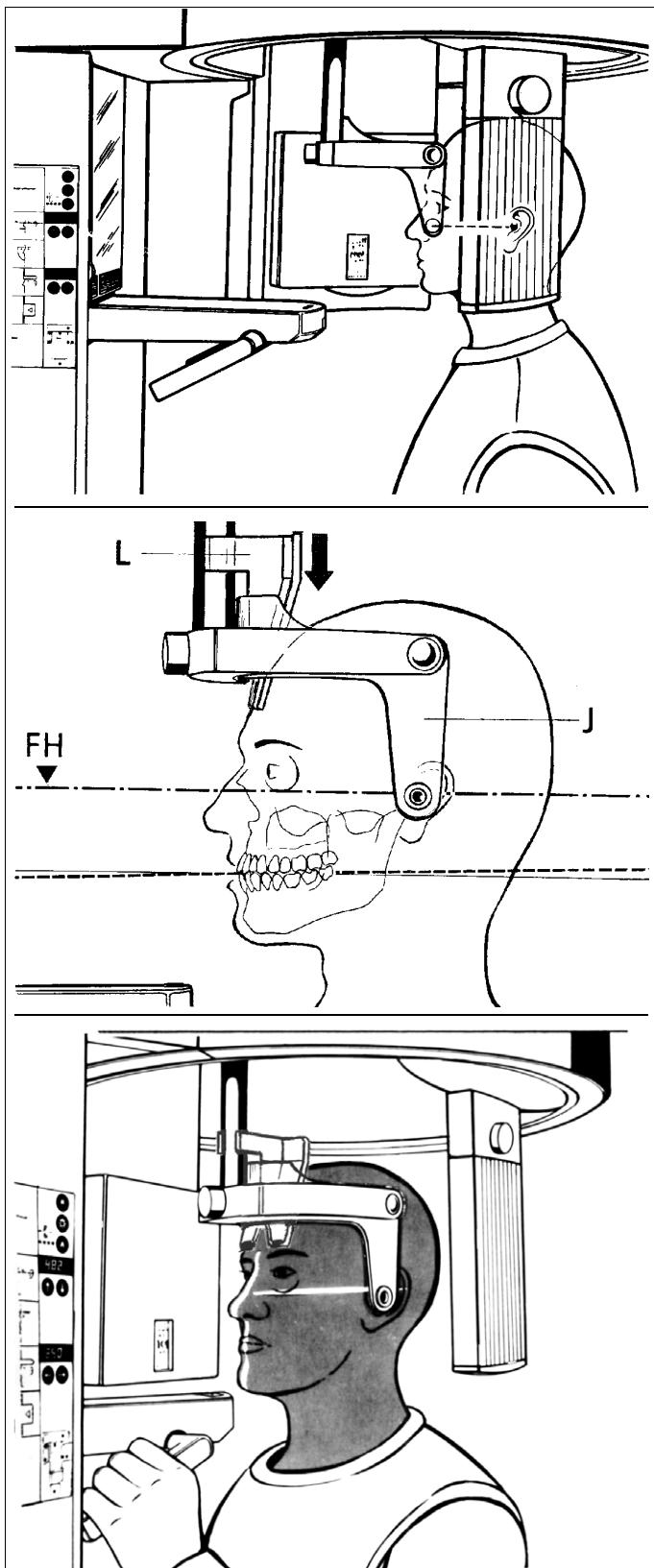
With programs P1, P10, P14 and P15, the radiation time changes as a function of the width of the temple supports.

- Swing back the mirror by pressing on field **B**.
- Have the patient take a **small** step toward the column.
Recheck the FH-line position.
- Have patient press tongue against roof of palate.

Digital displays

The reference values for height and forehead support are displayed on the control panel.





Exposures of the Temporomandibular Joint, P4 – P9 Programs with Head Positioner

- For these exposures the head positioner must be used (see page 23).
- Using the ↑ and ↓ keys, adjust unit height so that ear fixations and external auditory canals match up.
- Remove chin support and bite block.
- Move the chin support to the value indicated for the respective mandibular joint exposure under "**Exposure Programs**".
- Position the patient's head in the head positioner. Close the temple supports so that the ear fixations are inserted in the external auditory canals.
- Ensure that the **spine is slightly tilted** as described before (Have the patient take a small step toward the column).
- Swing out the mirror.
- Switch on the **light localizer** to set the correct position. Press the key on the control panel.
- Clip contact spacer **L** onto the tube after head positioning and push downwards to support forehead

The Frankfurt Horizontal FH

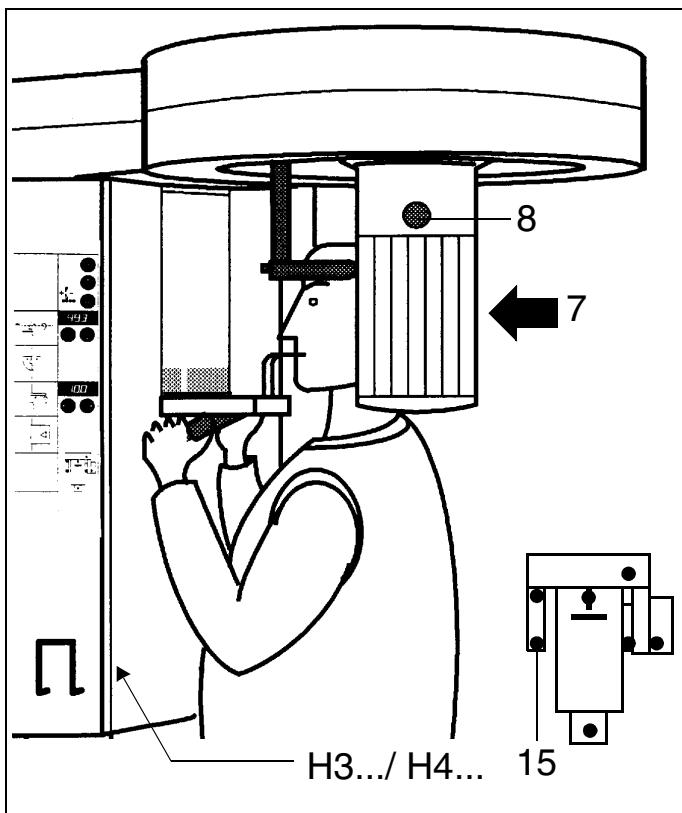
light beam should reflect the plane passing through the upper margins of the ear fixation and the lower margins of the orbits.^{*}

The FH line can be vertically adjusted with the knob (3)

- Swing back the mirror.

^{*} In case of the temporomandibular exposure programs P5, P7 and P9, the head setting deviates from the FH, see the "Exposure Programs" chapter.

6.3 Final Preparations



- Switch off the light localizer at the control panel.
- The image receiver (7) must be pushed all the way to the stop.

i NOTE

To remove the image receiver, turn the rotary knob (8) and pull the image receiver out.

⚠ ATTENTION

Do not drop it!

When the image receiver (7) is not inserted up to the stop, Help LED (15) flashes. Insert the image receiver completely, LED (15) extinguishes.

The LED above the R-key on the Multitimer is now switched off to let you know that the unit is ready for the exposure.

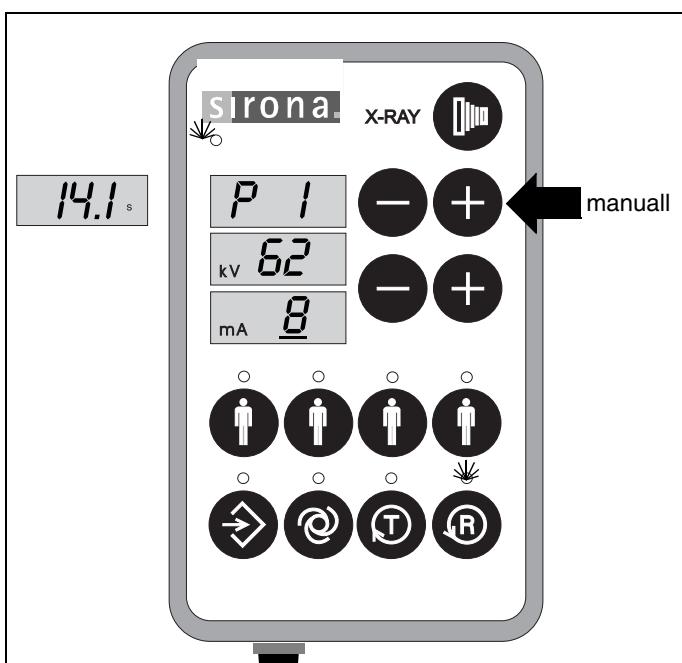
⚠ ATTENTION

IMPORTANT REMARK:

Should the LED above the R-key go on blinking, call up the help message H3.. H4.. to look for the reason (Press release key).

The list of help messages you find at the inside of the door.

English



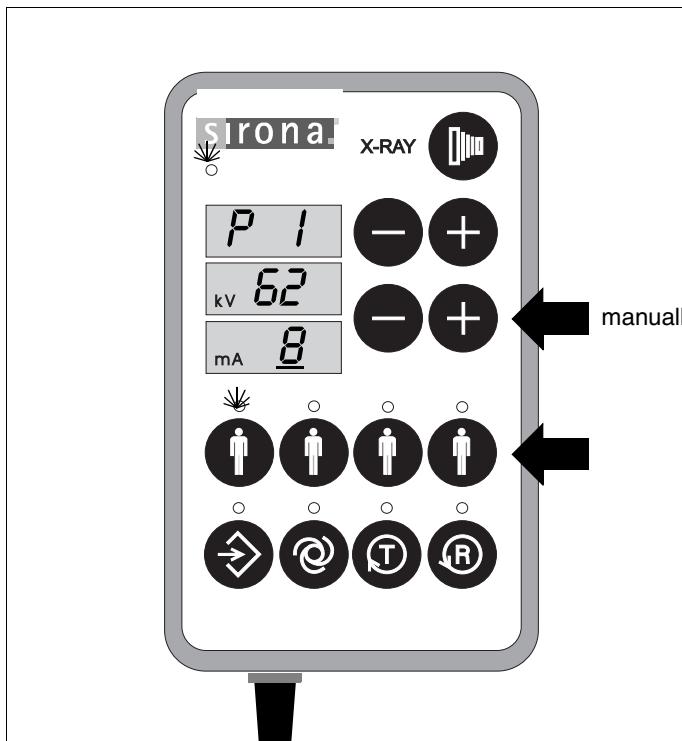
Selecting the Exposure Program

Selecting the Exposure Program by pressing the – + buttons.

The exposure program selected, e.g. P1, and the corresponding maximum exposure time are alternatively shown on the digital display.

i NOTE

When, with preselection of the exposure program, "O 1" appears on the display instead of, for example, "P 1", you have erroneously selected a mode provided for servicing. You can leave this mode by pressing the "Memory" button and then "Program +" or by switching to another exposure program.



Exposure Data

- Select Exposure Data by tapping one of the four patient symbol buttons.

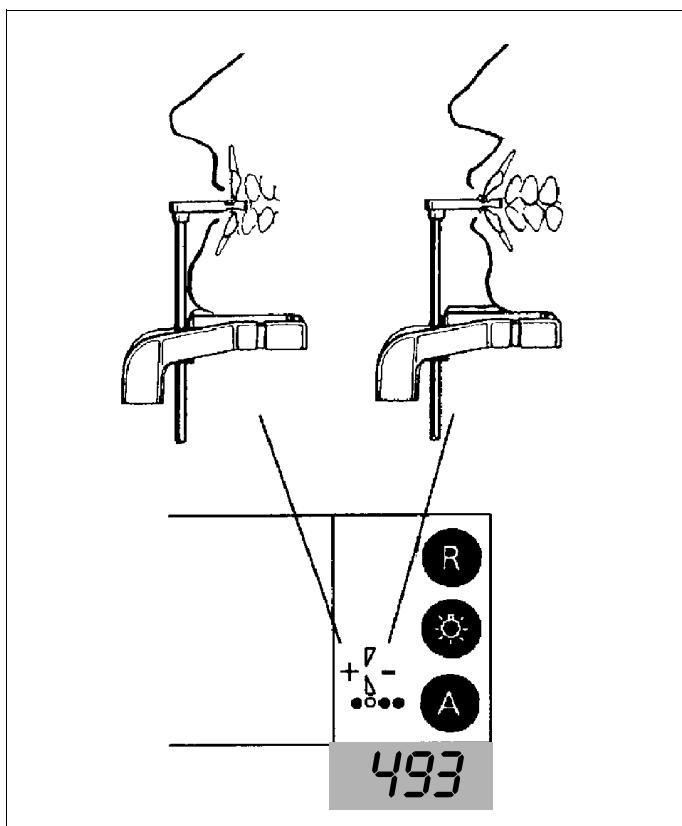
The LED above the button will then light up, and the respective **kV/mA** matched pair will appear on the digital display.

Manually, the exposure data can be modified with the – + buttons.

The **mA** values are automatically matched to the **kV** values. (See chapter "Program Values").

The **kV/mA** matched values for the patient symbol buttons are factory programmed.

Should you need to modify these values, see the chapter entitled "Programming".



Anomaly Button A

The Anomaly Button A is for manual compensation of anatomical relationships in the case of anomalies of the anterior teeth with the P1, P2, P10, P11, P14 and P15 programs.

In case of retrusion:

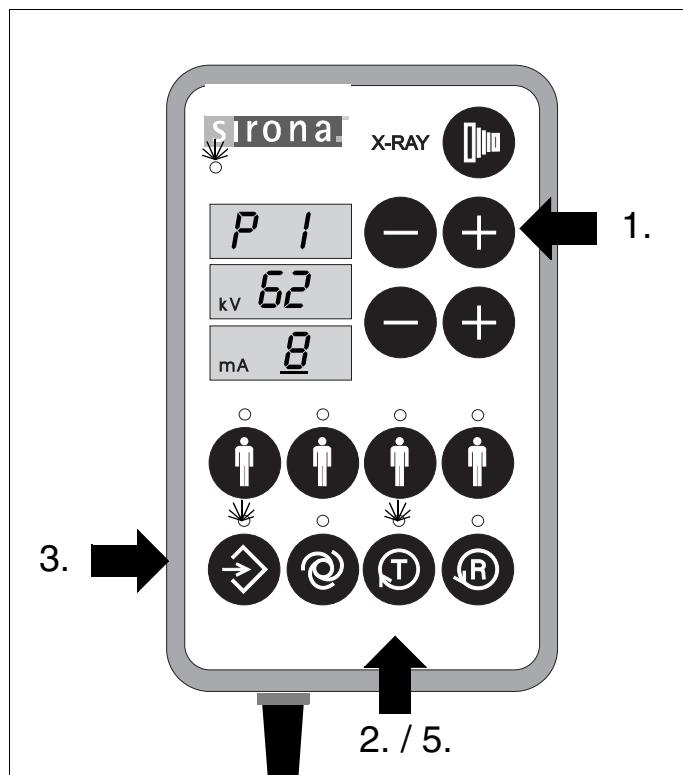
move one step in + direction

In case of protrusion:

move a step or two in – direction

The setting is shown by means of an LED.

After the rotary unit returns to its original position following the exposure, the settings automatically return to those of normal jaws (2nd LED from the left/Asia: 3rd LED from the left).



i NOTE

It is possible to set the Anomaly step, which as a rule is set to "0" (neutral) before every exposure, to another standard value (+1; -1; -2).

Proceed as follows:

1. Select program P1.

For the basic Anomaly setting, the 2nd LED from the left (Asia: 3rd LED from the left) lights up.

2. Press the Test Rotation key (T).

The LED above the T key lights up..

3. Press the Memory key.

The LED above the Memory key begins flashing.

4. On the control panel at the side, select the required new standard Anomaly step.

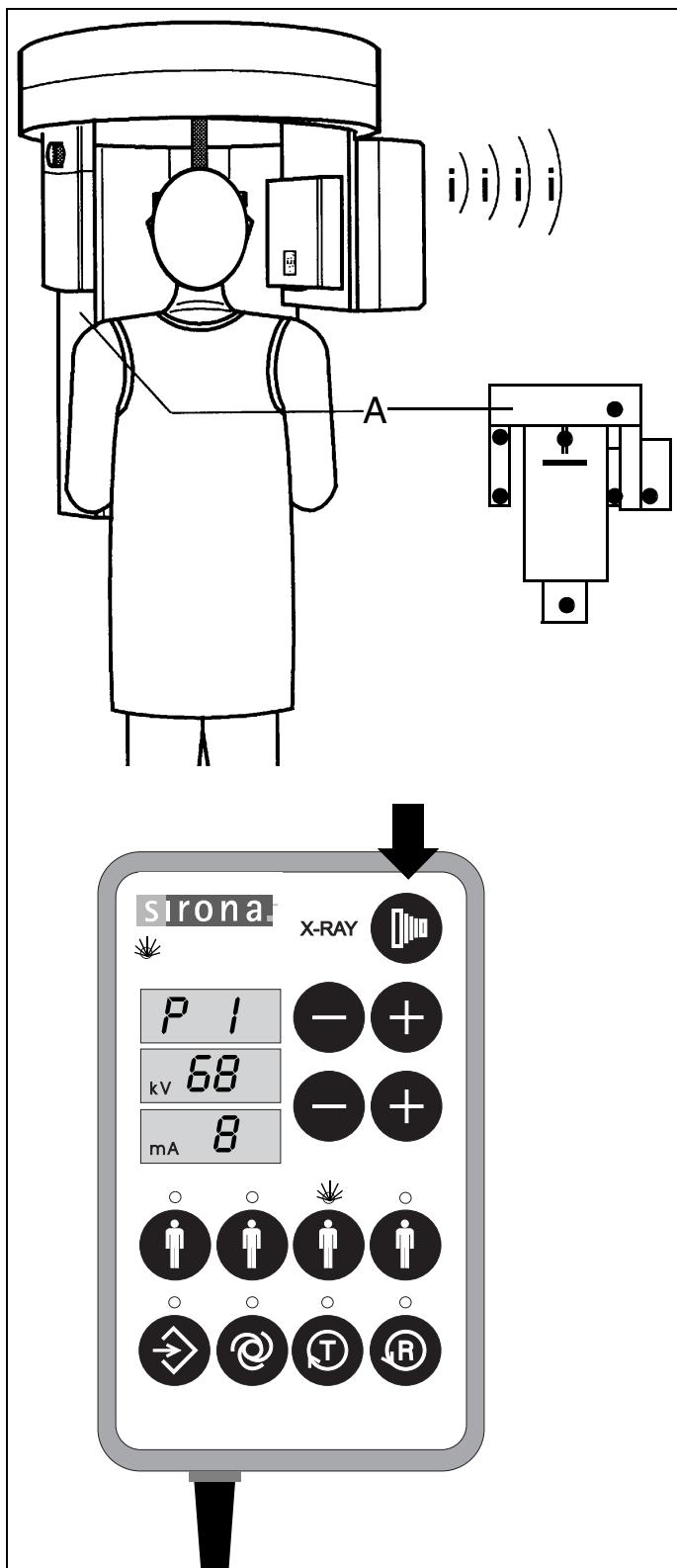
About 5 seconds after letting go of the Anomaly key, the LED for the pre-selected Anomaly step flashes for about 1 second.

The Anomaly LED then remains lit up. The Anomaly step is stored.

5. Press the Test Rotation key (T).

English

6.4 Releasing the Exposure



Observe the radiation protection guidelines explained on page 5.

i NOTE

The Help LEDs on the bottom of Control Panel A must all be extinguished and the Ready LED may no longer be flashing!

- The exposure is released by keeping depressed the release button.

The rotation movement is running automatically in accordance with the exposure program selected.

For P6 and P7 program only

The rotary unit moves back into the starting position after having completed the program parts P6.1 (P7.1).

Then have the patient open his mouth and release the program part P6.2 (P7.2).

During radiation,

the radiation indicator **X-ray** lights up.

The radiation duration is additionally accompanied by an **acoustic signal**.

- The exposure ends when the LED over button R blinks.
- Rotation and radiation automatically switch off.
- Open the temple supports and have the patient step out.

During the exposure

The program number (e. g. P1) is indicated at the Multi-timer.

After the end of the exposure

the exposure time actually required for the exposure lights up and the exposure is displayed on the PC.

i NOTE

In case of disturbances of the data transmission to the PC, the unit changes automatically into a safe mode, which saves the acquired image until the image has been transmitted by a service program (SiRescue). The safe mode is indicated by the help message H4 20.

! ATTENTION

In this condition the unit or the PC may not be switched off, in order to prevent the saved image from being deleted.

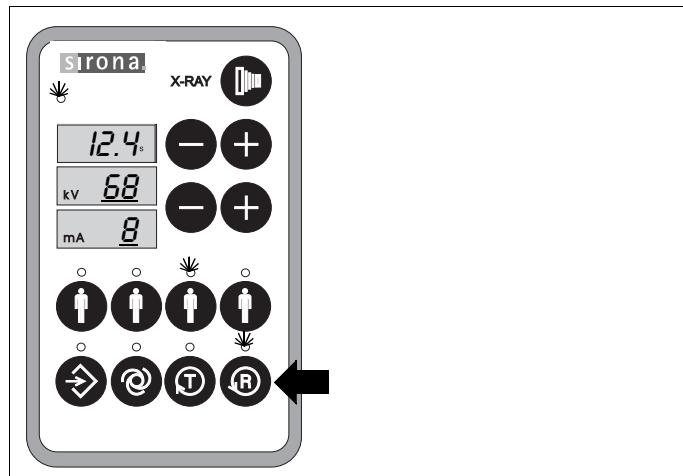
For operating the **SiRescue** service program please observe the corresponding software description in the **SIDEXIS User Manual**.

The help message H4 20 is no longer displayed after the image has been transmitted by the SiRescue service program.

i NOTE

Only then may the units be switched off or put into the ready for exposure state.

- After the exposure
Acknowledge awareness of the exposure time actually required for the exposure by pressing the return key R.
- Then bring the rotary unit in to the starting position by pressing the return key R once again.



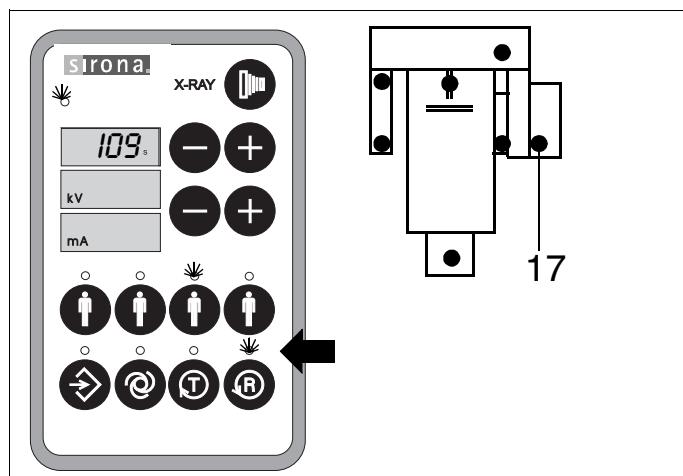
Interrupting the Exposure

If the exposure button is prematurely released, the exposure is interrupted.

The **kV/mA** value and the **Ready LED** blink at the Multitimer.

The exposure time passed until the interruption is shown.

- Press button **R** on the Multitimer.
- After the rotary unit returns to its original position, repeat the exposure.



Automatic Exposure Blockage

(Protection of X-ray tube)

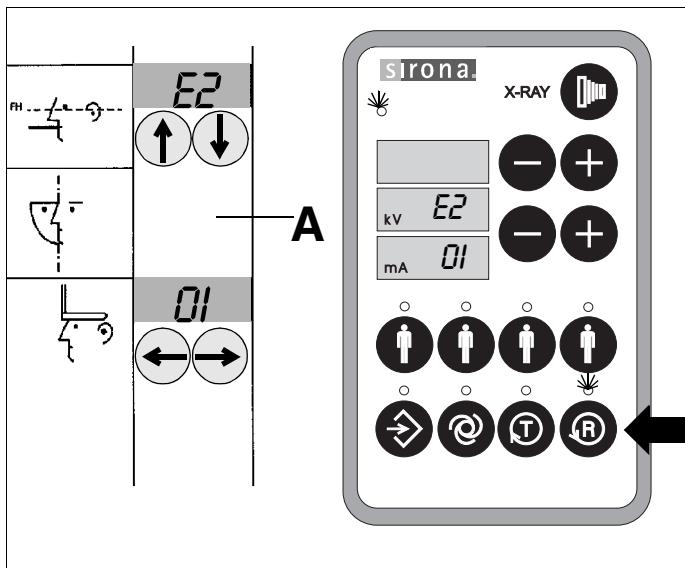
The automatic exposure blockage prevents premature triggering of a new exposure.

Help LED (17) for the cool-down interval illuminates on Control Panel A.

After the exposure key has been actuated, the automatic cool-off pause is indicated. The **Ready LED** continues flashing until the cool-off time has expired.

An exposure can only be triggered when all LEDs have extinguished.

Example: see page 7.



Error Message E...

Messages such as E2/01 in the **kV/mA** field indicate errors.

The **Ready LED** blinks. Simultaneously the error message is displayed on control panel **A**.

All unit functions are blocked.

- Press the button **R** on the Multitimer to reset display (poss. more than once).
- If the error message E continues to light up, switch the unit off and back on, if for an exposure the X-ray image is displayed on the PC.

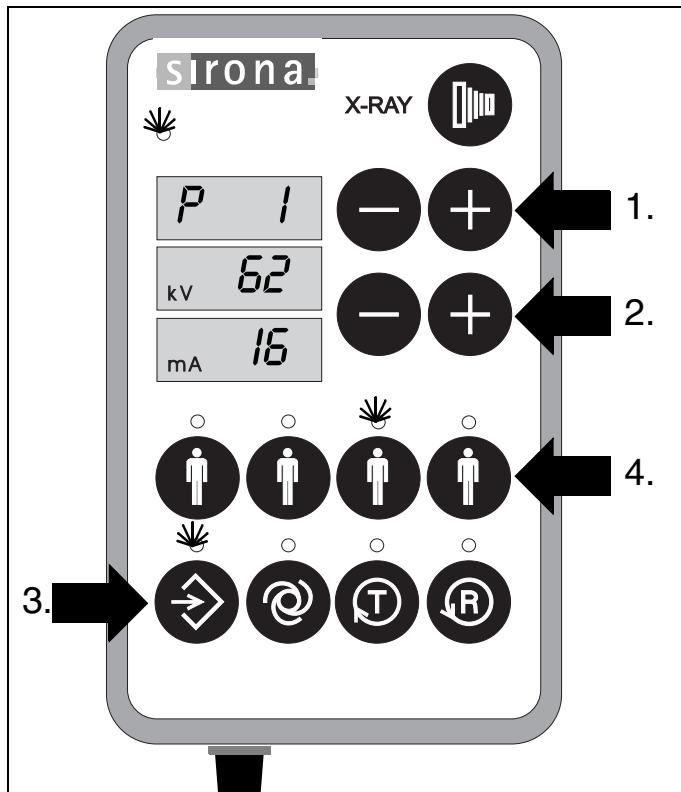
ATTENTION

The turn-off time must be at least 60s; otherwise the unit will not function correctly.

If error message has disappeared, all unit functions are normal again.

See appendix for **List of Error Messages** with remedy description.

7 Programming



In the factory **kV/mA** values have been assigned to the four program buttons.

For free programming the buttons can be programmed with different values. See '**Program Values**'.

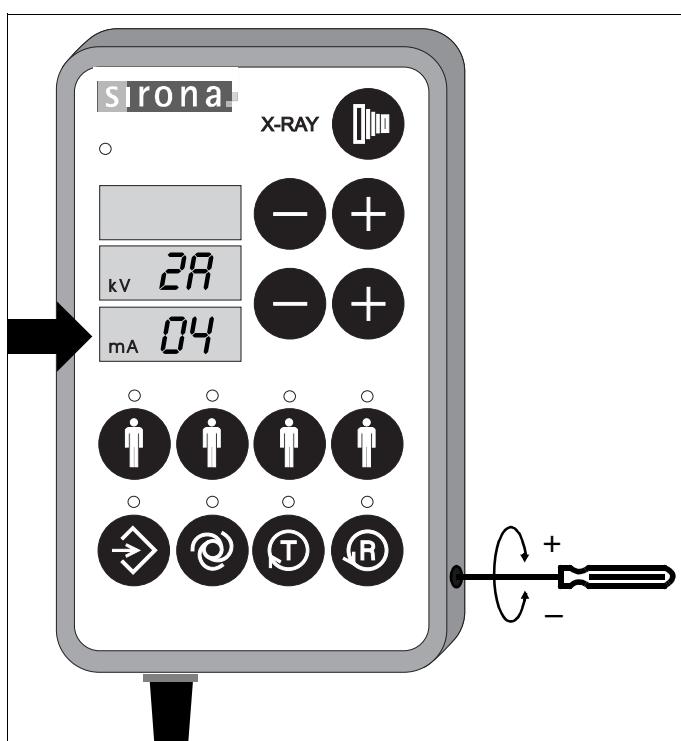
Programming Procedure

1. Push buttons – + to select program number P1 ... to be changed.
2. Push – + buttons to set desired **kV/mA** value on the digital display.
3. Push memory button. The LED over the memory button blinks.
4. Push the patient symbol button to be reprogrammed.
The LED above this button lights up.

The LED above the memory button is switched off.
The new values are now stored.

Programming is complete.

Please enter the new values in the '**Freely programmed values**' table.



Adjustment of the Exposure

The adjustment of the exposure is set to 03 at the factory.

If the degree of exposure is to be changed, use the supplied screwdriver as shown in the illustration.

During adjustment the corresponding switch position is briefly displayed (example 04).

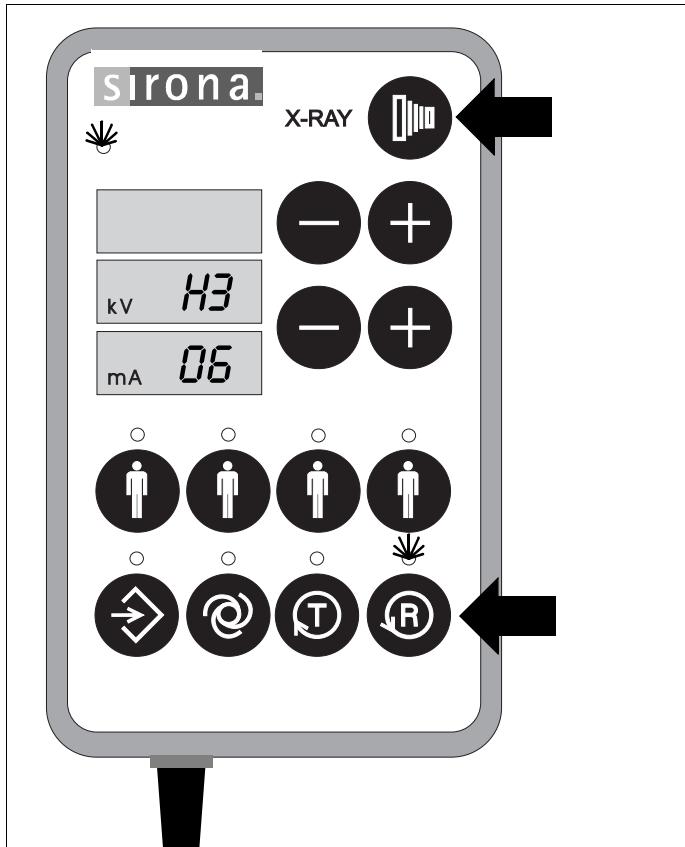
Step switch set to – = lower dose,
noisy exposures

Step switch set to + = higher dose,
low-noise exposures

NOTE

*Changing the adjustment of the exposure automatically alters the programmed kV/mA values.
See chapter 'Program Values'.*

8 Help Messages H3/H4



You want to release an exposure but the Ready-LED on Multitimer is still blinking:

ATTENTION

In case of unit failure the test button T on the Multitimer must be pressed first (radiation protection measure!).

- Press the **X-RAY** exposure button on Multitimer*. **H3** or **H4** help message appears on the **kV/mA** display.
- Read on the following list what is to be done to get the unit ready for the exposure.
- **Before** carrying out the corresponding indication, press return button **R** on the Multitimer to acknowledge the help message.

Help Messages H3

H3 01 Press one of the **R** buttons to return the rotation unit to the start position (Help-LED 16).

H3 05 Set the diaphragm on the wheel corresponding to the exposure program (Help-LED 18).

H3 06 Engage the locking button on diaphragm wheel properly (Help-LED 18).

H3 07 Move forehead support to permitted position (Help-LED 14).

H3 12 Press one of the **R** buttons to move the rotation unit to the tele position (Help-LED 16).

H3 20 Press the **R** button on the Multitimer to confirm the exposure data (Help-LED 17).

Help Messages H4

H4 01 Slide in the image receiver corresponding to the selected exposure program (Help-LED 15).

H4 03 Set SIDEXIS operational on the PC (Help-LED 13).

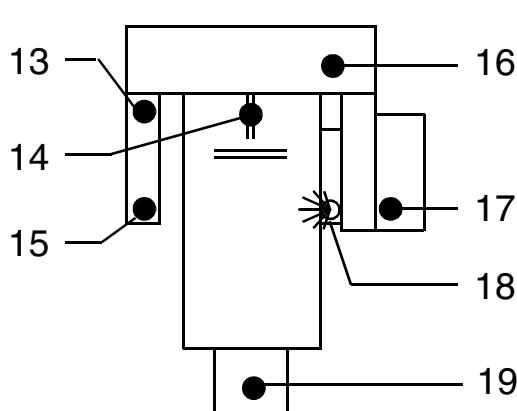
H4 05 Move the stand (without patient) into the tele position (Help-LED 19).

H4 06 Move the cephalometer (without patient) into the tele position (help LED 19).

H4 10 Image receptor not suitable for the set exposure (help LED 15)

H4 20 Transfer exposure by SiRescue service program to the PC, see SIDEXIS User Manual.

CAUTION! Do not switch off the unit until the help message goes out.



9 Program Values

9.1 Program Values for Code 2A

This series of steps is pre-programmed at the factory for the Federal Republic of Germany. It guarantees unrestricted compliance with the valid legal provisions which must be adhered to since January 1, 1999. Changing the program values from 2A to 1A is not permitted in Germany!

Elsewhere, this series of steps can be used world-wide, provided that country-specific requirements are taken into account.

Tabelle: Code 2A

Program	Program duration approx.	Exposure time max.	Factory-programmed values for code 2A with an adjustment of the exposure of 03				Freely programmed values or values with other adjustment of the exposure:.... – please enter here –			
										
P1	24s	14.1s	62/8	64/8	68/8	73/8				
P2	24s	11.8s	62/8	64/8	68/8	73/8				
P3	54s	16.2s	64/8	68/8	71/8	73/8				
P4	26s	8.1s	66/8	68/8	71/8	73/8				
P5	28s	10.1s	68/8	71/8	73/8	77/7				
P6.1+P6.2	27+27s	12.8s	68/8	71/8	73/8	77/7				
P7.1+P7.2	27+27s	18.7s	68/8	71/8	73/8	77/7				
P8	108s	25.3s	68/8	71/8	73/8	77/7				
P9	94s	22.9s	68/8	71/8	73/8	77/7				
P10	24s	11.8s	62/8	64/8	68/8	73/8				
P11	19s	14.4s	66/8	68/8	73/8	77/7				
P12	20s	4.9s	71/8	77/7	80/7	85/6				
P13	23s	14.4s	71/8	77/7	80/7	90/6				
P14	24s	8.1s	62/8	64/8	68/8	73/8				
P15	24s	8.1s	62/8	64/8	68/8	73/8				
P16	95s	21.4s	73/8	77/7	80/7	85/6				

Tabelle: Possible kV/mA combinations

kV	60	60	60	60	60	62	64	66	68	71	73	77	80	85	90
mA	3	5	6	7	8	8	8	8	8	8	8	7	7	6	6

9.2 Program Values for Code 4A

The code 4A, which selects a reduced series of steps for children and non-adults, must be complied with as a minimum requirement for new installations or changes in the site/operator in the Federal Republic of Germany since January 1, 1999. Changing the program values from 4A to 1A is not permitted in Germany.

Elsewhere, this series of steps can be used world-wide, provided that country-specific requirements are taken into account.

Tabelle: Code 4A

Program	Program duration approx.	Exposure time max.	Factory-programmed values for code 4A with an adjustment of the exposure of 03				Freely programmed values or values with other adjustment of the exposure:.... – please enter here –			
P1	24s	14.1s	62/8	64/8	69/15	73/15				
P2	24s	11.8s	62/8	64/8	69/15	73/15				
P3	54s	16.2s	64/8	68/8	71/15	73/15				
P4	26s	8,1s	66/8	68/8	71/15	73/15				
P5	28s	10.1s	68/8	71/8	73/15	77/14				
P6.1+P6.2	27+27s	12.8s	68/8	71/8	73/15	77/14				
P7.1+P7.2	27+27s	18.7s	68/8	71/8	73/15	77/14				
P8	108s	25.3s	68/8	71/8	73/15	77/14				
P9	94s	22.9s	68/8	71/8	73/15	77/14				
P10	24s	11.8s	62/8	64/8	69/15	73/15				
P11	19s	14.4s	66/8	68/8	73/15	77/14				
P12	20s	4.9s	71/8	77/7	80/14	84/13				
P13	23s	14.4s	71/8	77/7	80/14	90/12				
P14	24s	8.1s	62/8	64/8	69/15	73/15				
P15	24s	8.1s	62/8	64/8	69/15	73/15				
P16	95s	21.4s	73/8	77/7	80/14	84/13				

Tabelle: Possible kV / mA combinations with patient symbols 1 and 2 pre-selected

		kV	60	60	60	60	60	62	64	66	68	71	73	77	80	85	90
		mA	3	5	6	7	8	8	8	8	8	8	8	7	7	6	6

Tabelle: Possible kV / mA combinations with patient symbols 3 and 4 pre-selected

		kV	60	60	60	60	60	62	64	66	69	71	73	77	80	84	90
		mA	9	10	12	14	16	16	16	16	15	15	15	14	14	13	12

9.3 Program Values for Code 1A

Since January 1, 1999 this series of steps is no longer permissible in Germany.

Tabelle: Code 1A

Program	Program duration approx.	Exposure time max.	Factory-programmed values for code 1A with an adjustment of the exposure of 03				Freely programmed values or values with other adjustment of the exposure:.... – please enter here –			
										
P1	24s	14.1s	62/16	64/16	69/15	73/15				
P2	24s	11.8s	62/16	64/16	69/15	73/15				
P3	54s	16.2s	64/16	69/15	71/15	73/15				
P4	26s	8,1s	66/16	69/15	71/15	73/15				
P5	28s	10.1s	69/15	71/15	73/15	77/14				
P6.1+P6.2	27+27s	12.8s	69/15	71/15	73/15	77/14				
P7.1+P7.2	27+27s	18.7s	69/15	71/15	73/15	77/14				
P8	108s	25.3s	69/15	71/15	73/15	77/14				
P9	94s	22.9s	69/15	71/15	73/15	77/14				
P10	24s	11.8s	62/16	64/16	69/15	73/15				
P11	19s	14.4s	66/16	69/15	73/15	77/14				
P12	20s	4.9s	71/15	77/14	80/14	84/13				
P13	23s	14.4s	71/15	77/14	80/14	90/12				
P14	24s	8.1s	62/16	64/16	69/15	73/15				
P15	24s	8.1s	62/16	64/16	69/15	73/15				
P16	95s	21.4s	73/15	77/14	80/14	84/13				

Tabelle: Possible kV/mA combinations

kV	60	60	60	60	60	62	64	66	69	71	73	77	80	84	90
mA	9	10	12	14	16	16	16	16	15	15	15	14	14	13	12

10 Care the surfaces

Cleaning

Remove dirt and disinfectant residues regularly with a normal commercial cleaning medium.
Do not allow any liquid to enter the ventilating slots!
To avoid permanent staining, quickly clean away any medicament that spills on the surface.

Disinfecting

Disinfecting is possible by wiping with surface disinfectant. Observe the directions of the manufacturer when using! Use only tested and approved media!

Do not use agents containing the components phenol, peracetic acid, peroxide and other agents splitting up oxygen, sodium hypochlorite and agents splitting off iodine.

11 List of Error Messages

E... error messages

Remedy

E1 01	One of the keys on the Multitimer was pressed during start-up of the unit.	Press R key on Multitimer to reset display.
E1 03	Faulty communication with the unit.	Press R key on Multitimer to reset display.
E2 01	Appears after pressing exposure key. X-ray head overheated. Cool-down periods ignored.	Press R key on Multitimer to reset display.
E2 03	Faulty communication with the Multitimer.	Press R key on Multitimer to reset display.
E2 04	Zero-Power was re-initialized.	Press R key on Multitimer to reset display. Freely programmed values (see page 41) are canceled, sorry. Please reprogram (see page 39).
E2 10	Max. radiation time of program exceeded.	Press R key on Multitimer to reset display.
E2 20	Appears after pressing the exposure key, e.g. if x-ray room door contact not closed. Exposure lead in Multitimer cable damaged.	Close x-ray room door. Press R key on Multitimer to reset display. If error re-appears, poss. break in cable.
E2 35	Invalid data in data memory.	Press R key on Multitimer to reset display.
E3 09	Movement of height adjustment obstructed.	Check that height adjustment can move freely. Press R key on Multitimer to reset display.

⚠ WARNING

If this fault message occurs repeatedly during the motor-driven up and down movement of the rotary unit, especially when no patient is positioned, switch off the unit immediately and inform your service engineer without delay.

E3 10	Count for height adjustment too high/too low for reference setting.	Switch unit off and then on again and move it in the enabled direction until a valid display value is indicated.
E3 11		
E3 12	Key for height adjustment ↑↓ was pressed during self adjustment or is defective.	Press R key on Multitimer to reset display.
E3 21	Anomaly key A on control panel A was actuated during a start-up or before selftest of the unit finished.	Press R key on Multitimer to reset display.
E3 22	Light localizer key on control panel A was actuated during a start-up or before selftest of the unit finished.	Press R key on Multitimer to reset display.
E3 23	R key on control panel A was actuated during a start-up or before selftest of the unit finished.	Press R key on Multitimer to reset display.

E3 27	Forehead support prevented from moving away → from column, towards ← column (possibly stuck).	Remove obstruction. Press R key on Multitimer to reset display.
E3 29	The software endswitch was reached before the zero position.	Press R key on Multitimer to reset display.
E3 31	One of the forehead support adjustment keys ← or → on control panel A was actuated during a start-up or before selftest of the unit finished.	Press R key on Multitimer to reset display.
E3 32	X-ray head was prevented from leaving panorama position at start of exposure.	Remove obstruction. Press R key on Multitimer to reset display.
E3 33	X-ray head prevented from returning to zero position after exposure.	Remove obstruction. Press R key on Multitimer to reset display.
E3 47	Program card incorrectly inserted.	Check that program card is correctly inserted.
E4 01	Exposure interrupted by SIDEXIS.	Press R key on Multitimer to reset display. Check PC for readiness.

For error messages which are not contained in this list, switch the unit off and back on if for an exposure the X-ray image is displayed on the PC.

If the error occurs repeatedly, please call your service engineer.

 **ATTENTION**

The turn-off time must be at least 60s; otherwise the unit will not function correctly.

12 Inspection and Maintenance

Inspection and maintenance work must be performed at regular intervals to protect the safety and health of patients, users and third parties.

Annual inspection performed by the operator or other authorized personnel

As the operator, you should ensure the safety and reliability of your system by performing maintenance on it at regular intervals (at least once annually) or having this work performed by your dental dealership.

Maintenance performed by the service technician

In addition to the scheduled annual inspection by the user or persons contracted to perform this, a maintenance inspection must be performed after 4, 7 10 and then every two years.

Checking image quality

At regular intervals, however at least once a year, the user must evaluate the image quality.

For digital image receptors, the increasing number of repeated image processing operations to be made with the brightness or contrast control in the image processing software (e.g. SIDEXIS) is used as evaluation criterion.

If this evaluation criterion is considered to be satisfied irrespective of the patient's anatomy or possible error sources such as patient positioning, a technician should be consulted immediately for elimination of possible system defects.

In addition it is necessary to observe country-specific requirements.

Furthermore, we would like to call your attention to our Quality Image Service. For this, please contact your dental dealer or the manufacturer directly.